Between fallow land and land use competition

- Land use changes and conflicts in rural and sub urban areas -

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contents

Introduction

1. Increasing demands of the society and the economy
2. Impacts of global change

worldwide shortage of land and especially of arable land will accelerate in the next decades

Serious problems and fundamental challenges for land policy, land use strategies and land management.

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Food security and production

growing world population

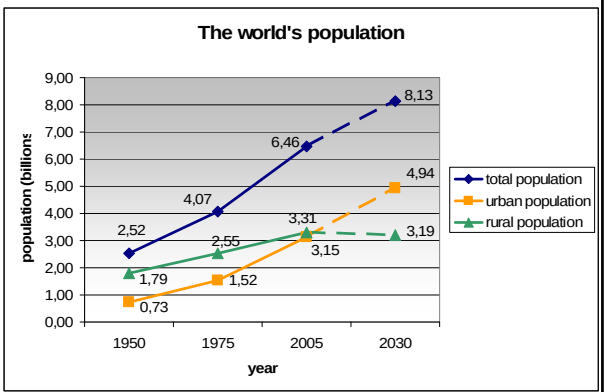
from 7 billion in 2011

to

8.9 billion in 2050

demand of food increases rapidly

more **residential land** and **arable land**



Resources: WORLD *POPULATION* TO *2300 - United Nations*

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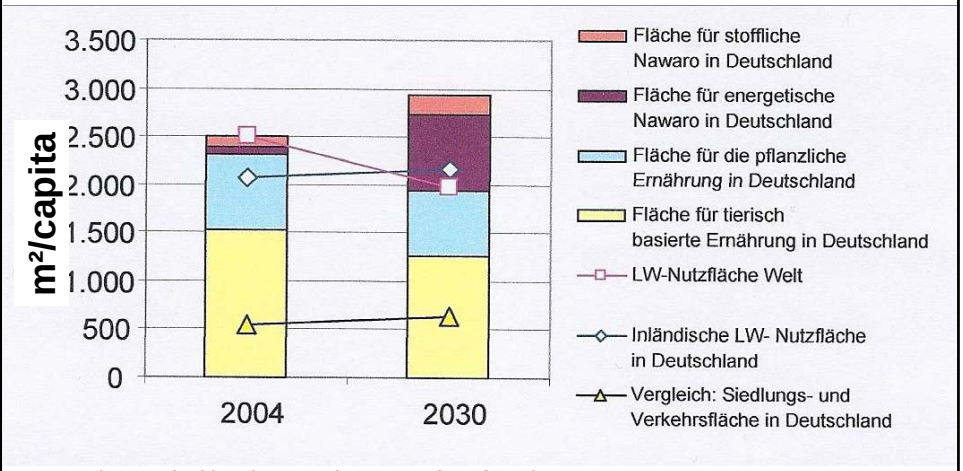
Food security and production



2004: demand of land exceeds **400 m²/capita** the available land

Source: Wuppertal Institut; Fraunhofer Institut 2010

Food Production

changing consumer behavior and eating habit

meat
instead of
crops and vegetables

Increasing demand
for **arable land**

Energy supply

To produce renewable energy, like solar power, bio fuels, wind parks, geothermie

Increasing demand for **land**

The **Three Gorges Dam** is a hydroelectric dam in China, which took over 28,000Ha agricultural land to be build.

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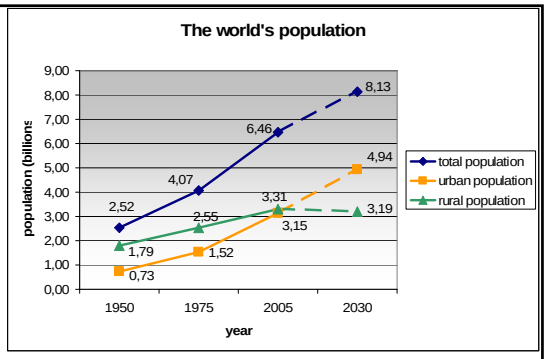
Urban growth

More than **50%** of the world's population live in cities since 2010.

the fast growing and sprawling urban agglomerations and cities are situated in regions with fertile soil

Every year **19.5 million** hectares of **agricultural land** is converted to spreading urban centres and industrial developments



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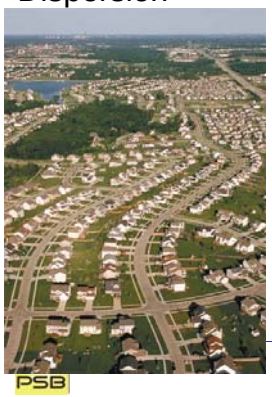
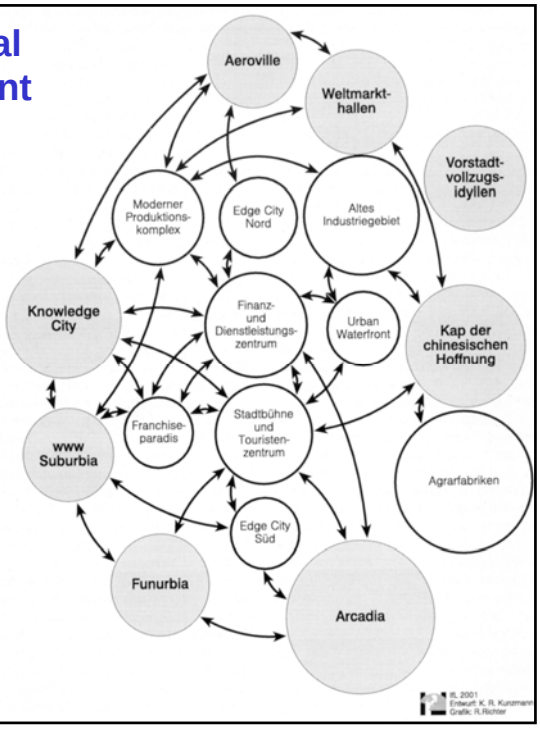
Trends in regional urban development

- Urban sprawl
- Suburbanization
- Functional segregation
- Fragmentation
- Dispersion





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Land use in China

Arable land per capita:
- China: 0,11 ha
- Word‘s average: 0,23 ha

Trends 1991-2000:

- China‘s population has increased annually by 12,5 mio.
- nearly 10 mio. ha cropland area was converted into built up, forest land and others or destroyed by disasters like natural hazards and land degradation

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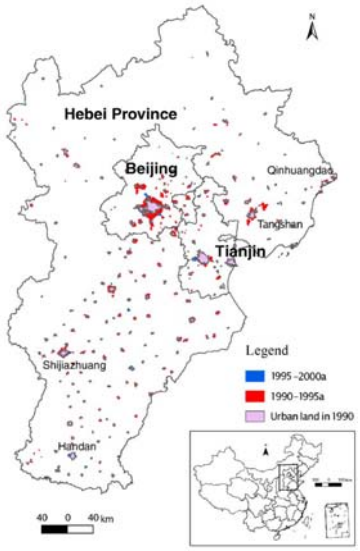
Development in BTH-Region



1990-2000

- expansion of urban area: 71 %
- max. annual growth rate: 5,5 %
- Land expansion rate was faster than urban population increase rate in the last decade
- loss of farmland:.310.000 ha/a
- fragmentation of land use
- fastest growing of small cities < 100.000

M. Tan et al. 2005

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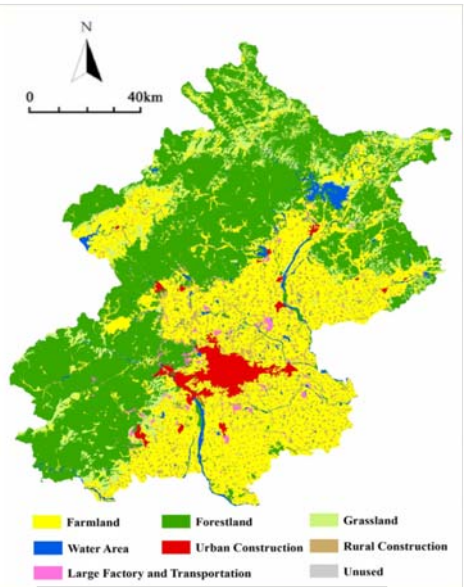
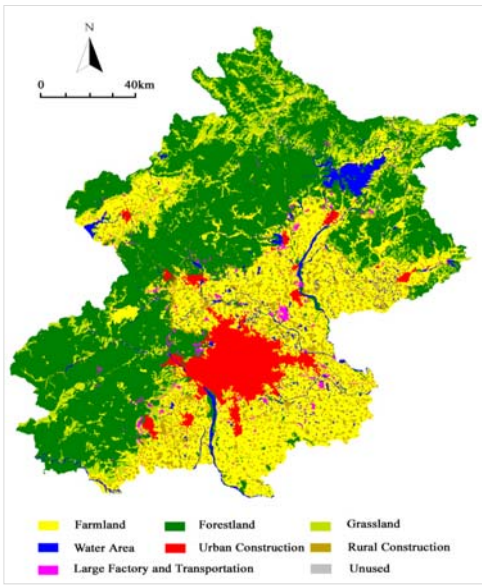
Challenges of land use in the BTH-region



Beijing Land Use Map in **1990** (Xie et al. 2007)



Beijing Land Use Map in **2000** (Xie et al. 2007)

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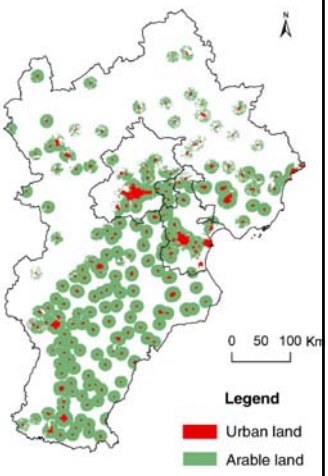
Driving forces

1. High economic growth in 2009: GDP 11,2 %
2. Mass migration from rural to urban areas. Most important driving force in small cities is the rate of available urban land per capita:
   - small cities: 233,2 m²
   - large cities 114,3 m²
3. Strict household registration systems and urban development guidelines held back the migration from the medium and large cities: growth rate of the small cities was much faster
4. Governance: Planning decision of local leaders to convert land because they believe, that urban land is more profitable than agricultural land on a long term



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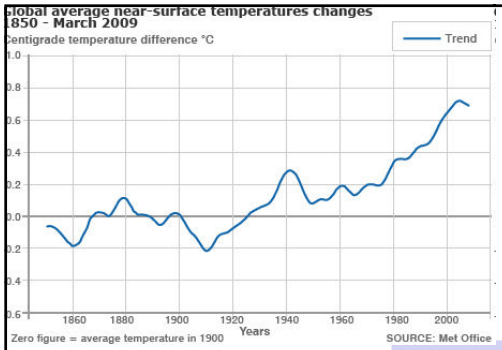

Climate change

Land desertification

rise of the average temperature

droughts facilitate land use change

It has been estimated that 10–20% of drylands are already degraded, the total area affected by desertification being between 6 and 12 million km²

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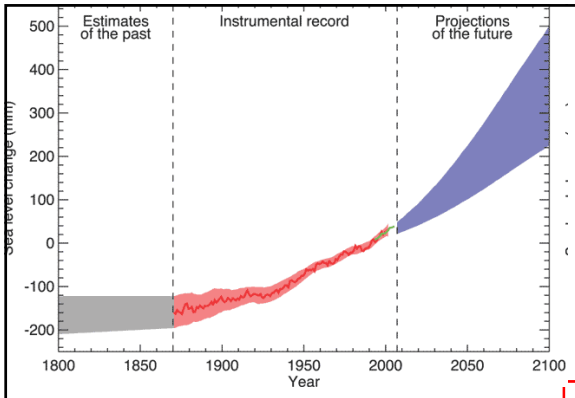

Climate change

Losses of land

rise of sea level

flooding

- Sea level measurements in geologically stable Environments show a rise of around 200 millimeters (8 inches) per century, or 2 mm/year.
- IPCC models suggest that 33% of the global coastal wetlands will be under water by the year 2080

Source: Bindoff, N.L, 2007: Observations: Oceanic Climate Change and Sea Level.

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Environment Protection

To keep ecological systems and their functions and also the biodiversity, often more extensive zones are needed.

Riau, Indonesia,
to protect the **biodiversity**
526.548Ha extra land
in the centre area.

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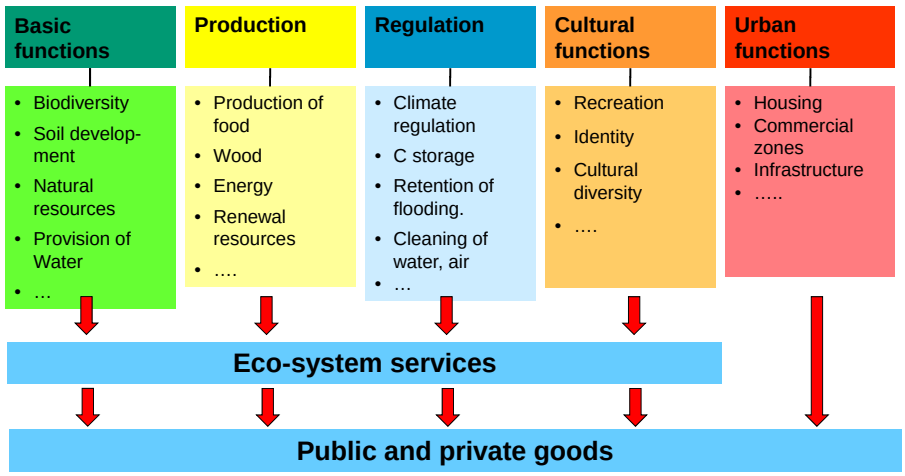
Multifunctional land use



MEA 2005,

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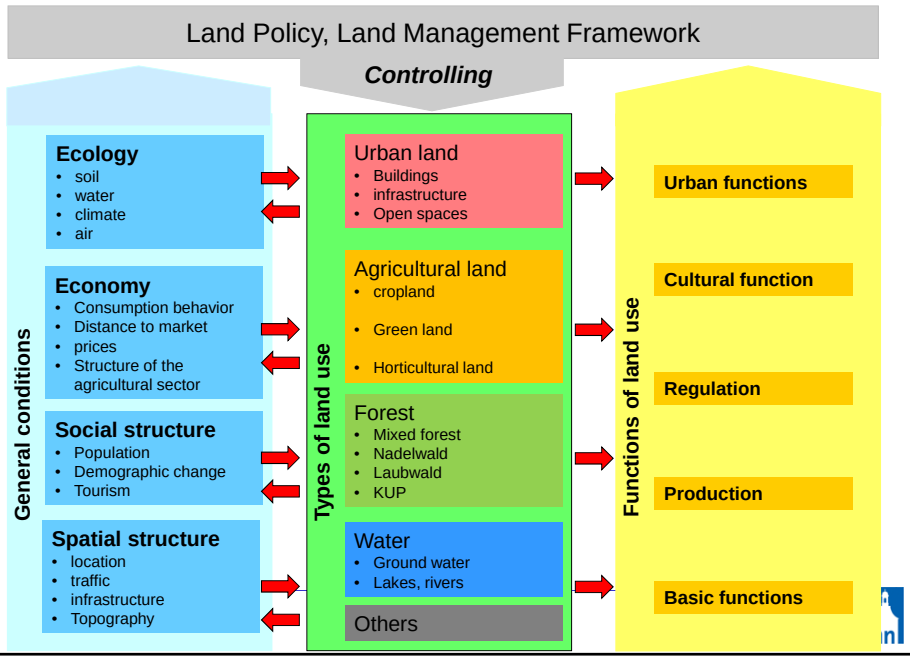
System of Uand Use and Land Management

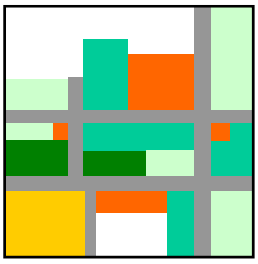


Visions and Strategies

Vision of post oil city: Compact, mixed land use, short distances

Problem:

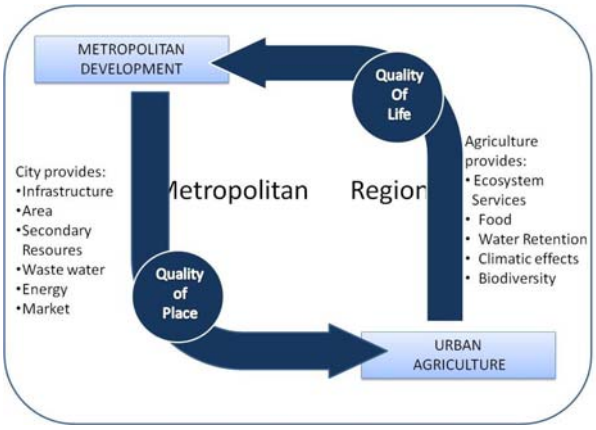
Difference between physical and social structure



	Formal Land Use	Functional Land Use
	Stores	Commercial
	Factories	Industrial
	Park	Leisure
	Apartments	High density residential
	Bungalows	Low density residential
	Road	Transportation
	Vacant	None

Songdo city in South Korea , the 9 million square metres master Plan includes commercial office space, residences, retail shops, hotels as well as civic and cultural facilities.

Agriculture in metropolitan areas



- Vertical Farming
- Sky Farming

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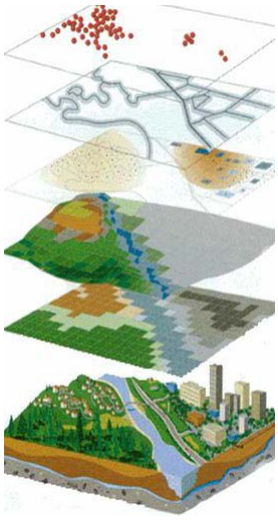
Regional Masterplan Land Use



Social aspects

Land tenure
Infrastructure

Economic aspects

Natural resources
Biodiversity

Settlement

Masterplan
multufunctional land use

Conclusions

Targets

- Post oil settlements (compact …)
- Support of infill development
- Preserve open spaces and landscape
- Effective and efficient land use

Strategies

- Monitoring of land use (world wide)
- Assessment of eco system services of land use
- Regional master plan land use
- Land management

Thank you very much!

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