Chinese River Basins
Yellow River, Huai, Interior Basins

Preliminary results of the GCI II survey

River Basins and the Water-Energy-Food Security Nexus

Report by Sina Marx (GWSP IPO)
Northern China:
- 20% of the water resources
- 65% of cultivated land
- 50% of grain
- nearly all of the wheat and maize
- accounts for more than 45% of China's GDP
- semi-arid zone in Yellow R. basin
  main irrigated crops are wheat, maize and cotton,
  rainfed cropping is marginal
- Semi-tropic Huang-Huai-sub-zone
  double cropping where irrigation is provided.
  Main irrigated crops: wheat, maize, rice
Yellow
- length: 5,500km,
- catchment area: 795,000 km²
- population: 107 million
- cultivated land: 12 million ha
2% of national water resources; supports about 12% of national population and 15% of national farming lands

Huai
- length: 1,078 km,
- catchment area: 330,000 km²
- mouth: historically Yellow Sea, now Lake Hongze

The Huang-Huai-Hai sub-zone (HHH) double cropping where irrigation is provided
Main irrigated crops: wheat, maize, rice
Uneven distribution of water resources

‘South to North Water Transfer Project’
multi-decade infrastructure project to better utilize national water – envisaged to divert ca. 44 billion m$^3$ of water annually from the Yangtze to the Yellow and Hai Rivers
China is subject to highly variable rainfalls that contribute to frequent droughts and floods, which also happen simultaneously in different regions.
irrigation produces nearly 75 percent of the cereals and more than 90 percent of cotton, fruits, vegetables and other agricultural commodities on around half of the farmlands in China.

→ Major relevance for food security

→ In the future: important role to increase production for a growing population, since now farmland expansion becomes a limiting factor
China is the largest hydroelectricity producer in the world with around 720 terawatt-hours (2010) ~ around 17% of domestic electricity use.

till 2001, the total install capacity of all reservoirs (built or under construction) in the mainstream was up to 11.216 million KW.

the development of hydropower in the Yellow River is relatively low and the hydropower development potential in the Yellow River is large. At present, national policies on power development have given hydropower the highest preference.
Risk management

• historic floods and droughts
• Yellow River: suspended → flood management high priority
• **Flood Control Law (1997)**
  1st law for prevention and control of natural disasters, e.g.
  - mechanism of designating “planned reserve zones or areas”
  - operation of reservoirs and other hydraulic works
  - multiple use considerations in river course realignments and lake embankments
Which direct and indirect anthropogenic factors have the strongest impacts on food production?
• with rapid population growth and development of industry and agriculture, wastewater often fed directly back to the rivers without treatment
→ drastic reduction in water quality
  - 73% of the Huai river and 71% of the Yellow River are classified as polluted by Chinese standards (34% of Yellow River worse than UNEP level five)
  - In 2004, of all monitored river sections, 28% were unsafe for any use and only 32% were safe for industrial and irrigation uses only. Of the 27 major monitored lakes and reservoirs only 29% were safe for human consumption after treatment
• not until 2007 that the rising trend of water pollution began to show a sign of reverse, but water pollution still very serious
Governance –
Historical Transboundary Conflicts

- River Basin Management Commissions (RBMC)
  subordinate organization of the MWR for its seven large river/lake basins: Responsible for preparing basin-wide water allocation plans and providing technical direction and guidance to local governments within the basin.
  - e.g. Yellow River Conservancy Commission (YRCC): agency of the Ministry of Water Resources in charge of the Yellow River basin and the inland river basins, takes on the responsibilities of water administration in these basins.
- water allocation → stakeholders from agriculture and energy sectors are involved in the water management process indirectly through the establishment of annual water allocation scheme
all water resources owned by the state

- In 2002 modification to build a legal foundation for IWRM and demand management: amended Water Law enshrines the principles that everybody should have access to safe water, and that water conservation and protection are a priority.
Summary and Way Forward

• Significant water quality and quantity issues

• History of massive technical interventions

• BUT: slow turn towards ecosystem protection and IWRM