


中国中部、武漢市における経済発展と環境保全

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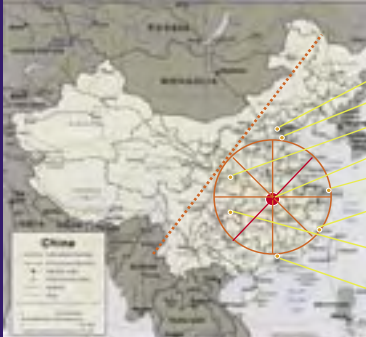
- ・ 中国経済の地理的中心に位置する武漢市を例に、中国の中部における環境と生態系の実態について報告する。
- ・ 武漢市の地表水は比較的豊富で、長江と漢水という大河が武漢で合流する。またこの地方には非常に多くの湖が存在し、2つの大河の小さな支流が多数流れている。
- ・ 過去5年間、武漢の経済は比較的良好的な発展を遂げてきた。第1次、第2次、第3次産業の1999年から2002年の変化はスライドの図のようにになっている。
- ・ 武漢市の環境保護の面について触れると、大部分の地表水は、国家の3級標準（いくらか汚染されている水）に達している。標準を超過しているのは、窒素と燐による汚染である。
- ・ 廃水の状況は、工業廃水が少なくなって、生活廃水が徐々に増加している。工業廃水は、基本的に90%前後の処理基準達成率を実現している。
- ・ 工業廃水と都市廃水に現れている主要な汚染問題は、窒素、COD、クロムである。
- ・ 大気の状態は、1999年ころから平均濃度が下がってきている。主なものは浮遊物で、粒子状物質、二酸化硫黄、二酸化窒素である。
- ・ 騒音は、武漢市では基本的に規制が実現しているが、交通の騒音と建設の騒音が現在ではかなり大きくなっている。
- ・ 固体廃棄物の主な処理方法は、埋め立てである。環境保護に支出される資金は増加しつつあり、都市の植林と森林面積は着実に増加している。
- ・ 国連開発計画の支援で、武漢持続可能性計画（Sustainable Wuhan Project）が1997年5月から1年間実施され、比較的成功的に実施されている。これはスライドにあるように、準備段階、計画段階、実行段階の3つの順序で実施され、以下の6つの優先的な環境問題について検討された。すなわち、地表水汚染、都市固形廃棄物の管理、汚染の制御、自動車の排気ガス汚染、都市の生態系建設、経済発展の調整と生産力の配置。
- ・ 都市生態環境についての問題点は、急速な人口増加、低い民度、長期的都市計画の欠如、インフラストラクチャーの不足、自然環境の保全などである。
- ・ 以上のような努力の結果、武漢市の都市生態環境には持続可能な方向に向かう改善が見られ、スライドにあるようないくつかの提案がなされた。武漢市を中国中央部の緑に富む環境保護モデル都市にすることは可能と考えられる。



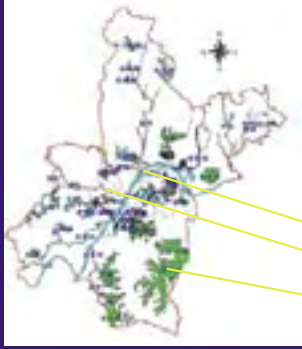
Economic Development and Eco-environment Protection in the Central China- the Case of Wuhan City

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1 Brief introduction of the Wuhan City



- *Location*
- Beijing
- Tianjin
- Xian
- Wuhan
- Shanghai
- Fuzhou
- Chongqing
- Guangzhou



- *physical geography*
- Water surface area: 1/4
 12 rivers and 140 lakes
- Land: low mountain 5.8%; hill 12.3%; ridge 42.6%; plain 39.3
- Green land: 34.5%; 8,24 m² per capita
- Yangtze river
- Hanshui river
- lakes

- *History and culture*
- history over 3500 years;
- birthplace of Chu culture
- many historic sites



Tower of Yellow Crane



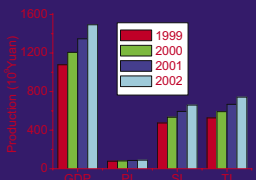
Guaiyuan temple



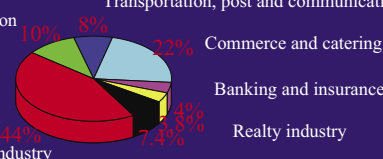
site of the Revolution of 1911

2 Economic development status

- Wuhan, an important national industrial base, is characterized by her solid industrial foundation and strong comprehensive supporting system.
- The economic development has been greatly improved in the past 5 years.



PI = Primary Industry;(3-4%)
 SI = Secondary Industry;(12-13%)
 TI = Third Industry (12-13%)



Industry 44%
 Agriculture 7.4%
 Construction 10%
 Transportation, post and communication 8%
 Commerce and catering 22%
 Banking and insurance 4.9%
 Realty industry 3.8%



武漢

- Build-up city area: near 250 km²
- pillar industries: automobile industry; communications industry; petrol-chemical industry; high and new tech industry
- convenient traffic
- rate of using tap water 100%
- rate of family gas usage above 90%
- income per capita about 8000 yuan/year

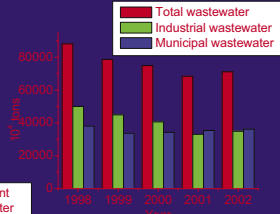
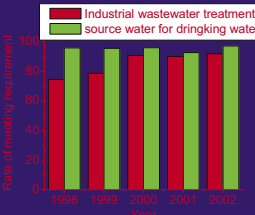


3 Eco-environment Status and Protection

- *Surface water*
 - Water qualities of the main rivers in the Wuhan City have reached the related standards in China
 - Few small rivers exceed the standards in Nitrogen and Phosphate indexes
 - All the lakes in the city have been in eutrophication status
 - The quality of about 97.21% of source water for drinking met the national standards

Wastewater

The volume of wastewater decreased against the increase of GDP

- industrial wastewater treatment increased in the past 5 years
- Source water quality for drinking water has met requirement at a rate above 90%

Wastewater in 2002

the total wastewater discharged was up to 71.190 million tons,

- industrial wastewater 49.13%
- municipal wastewater 50.87%

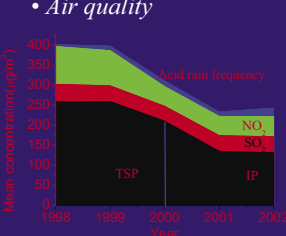
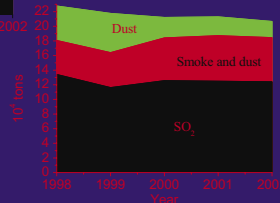
Industrial wastewater

The main pollutants

- Chromium (VI) (3.01 tons)
- NH₃-N (1731.96 tons)
- COD (55190.69 tons)

Rate of the treated: 92.01%, increasing by 1.82%;
Rate of recycled water: 68.40%.

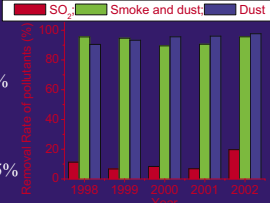
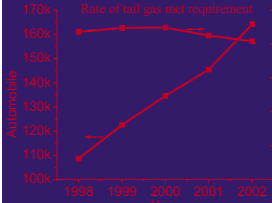
Air quality

- TSP decreased sharply
- IP (inhalable particles)
- SO₂ increased a little
- NO₂ decreased
- acid rain has been worsen

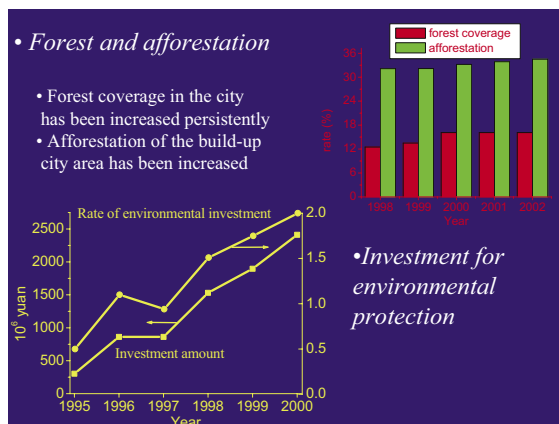
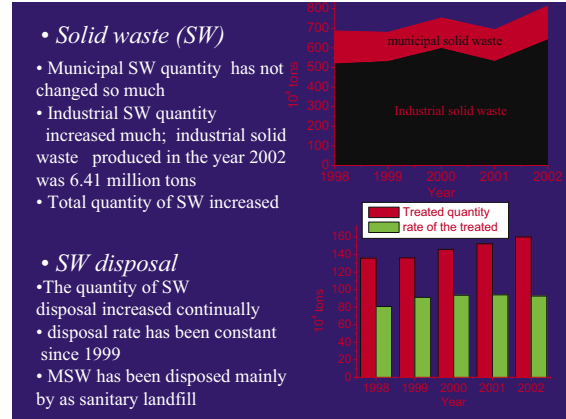
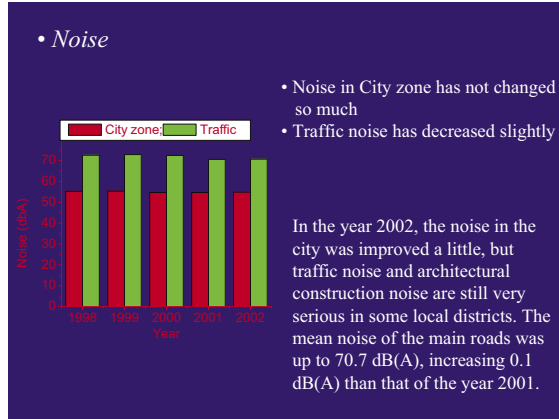
- Industrial exhaust gas
- SO₂ emission has been constant
- Smoke and dust increased
- Dust has been decreased
- Total emission decreased

Removal of pollutants

- SO₂ treatment rate has been low; increased only in 2002 up to 20%
- Smoke and dust treatment maintained floating above 90%
- Dust treatment increased continually but slightly above 95%

- Automobiles and tail gas
 - Automobile increased greatly
 - The rate of tail gas met requirement decreased a little. However more and more automobiles met the tail gas exhaust requirement.



4 Sustainable development of Wuhan City
— an UNDP project

- Sustainable Wuhan Project (SWP) (May 1997 -- June 1998)
- supported by United Nations Development Programme (UNDP)
- executed by China International Center for Economic and Technical Exchanges (CICETE)
- its implementing agency is Wuhan Municipal Government (WMG)
- its cooperation agencies are the United Nations Center for Human Settlements (UNCHS) and United Nations Environmental Programme (UNEP)

• *three phases*

The main activities of **the first phase**

- Mobilize the participation of stakeholders
- Update Environmental Profile
- Screen the projects from approved strategies and its action plans
- Establish environmental management information system and GIS

the second phase

- Formulate strategies and its action plans for the identified environmental priority issues
- Organize and implement the demonstration project
- Formulate the environmental management strategies based on Agenda 21
- Compile projects proposal
- Seek international fund and technical assistant; prefect GIS

the third phase

- Implement investment and technique assistant
- Summarize experiences of project implementation
- Replication in the province, national and international level

• **Six environmental priority issues in the way of Wuhan's sustainable development**

- Surface water pollution
- Management on urban solid waste
- Catering pollution
- Automobile exhaust gases pollution
- Urban ecological construction
- Adjust economic development and allocation of productive force.

5 Problems and proposals on the urban eco-environment

• Problems:

- Fast population growth
- Low population quality
- City planning: short of looking forward and integrity
- Infrastructure facilities: backward

waster supply, gas supply, traffic and communication

- Protection of the natural environment: ineffective

• Proposals:

1. Formulate new overall development planning for the city
2. Control the populations against rapid increasing and improve the qualities of townsfolk
3. Strengthen management and govern the city under the line of the laws
4. Integrate treatment of environment pollutions and recycle the waste
5. Develop ecological industrial parks under the guide of industrial ecology
6. Strengthen urban hygiene construction
7. Build the city with hills, waters gardens and forest. Stop filling lakes to get lands and for housing. Improve afforestation level and enhance cultural progress.

• Outlook



By the above means, Wuhan's urban eco-environment will be greatly improved in a sustainable way, and Wuhan will become more and more beautiful with lines of green corridors, many green plazas of large area, bright sky and crystal clear water of lakes. It is completely possible to build Wuhan a model city of environmental protection in the central China.

Thank you !