A Major Environmental Problem in Shanghai, China

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Introduction

Environmental Challenges

- Sits on the Yangtze River Delta on China's eastern coast
- The world's largest cargo port
- The largest center of commerce and finance in China and has been described as the "showpiece" of the world's fastest-growing major economy

Discharge of industrial wastes, the promoted application of fertilizers, pesticides and herbicides in farming, as well as heavy metal pollution are said to make the Yangtze one of the most polluted rivers in the world.
How polluted the Shanghai’s rivers are?

- The average concentrations of dissolved As (3.3 ± 1.3 μg/L) and Zn (1.5 ± 0.6 μg/L) were higher by factors of 5.5 and 2.5, respectively, comparing with those in other major world rivers.

- The average concentrations of Cd (2.6 ± 1.6 μg/g), Cr (185 ± 102 μg/g), Cu (115 ± 106 μg/g), and Zn (500 ± 300 μg/g) exceeded the EC standards by a factor of two, and Hg (4.4 ± 4.7 μg/g) by a factor of 4 to 5.

Public health impacts

- **Lead (Pb)** is a poisonous metal that can damage nervous connections and cause blood and brain disorders.
- **Arsenic (As)** contamination of groundwater has led to a massive epidemic of arsenic poisoning in Bangladesh and neighbouring countries. Many people have died from this contamination.
- **Mercury (Hg)** and most of its compounds are extremely toxic. Two famous diseases caused by Mercury in Japan is Minamata disease and Niigata Minamata disease. It is a neurological syndrome.
- **Cadmium (Cd)** accumulated in the rice crops. The local agricultural communities consuming the contaminated rice developed Itai-itai disease. One of the main effects of cadmium poisoning is weak and brittle bones.

The pollution sources—Industry

At the beginning of 19 century, the rapid development of modern industry brought tons of toxic waste water into Huangpu river.

At the end of 20 century, thousands of factories along the river discharged waste water. At one time, the Huangpu river became black smelly river.
The pollution sources

The concentrations of nutrients experienced tremendous increases during the past 50 years. The increase corresponded to the intensification of agriculture and the use of mineral fertilizers replacing traditional green manure.

The increasing population leads to the rapid increasing of human discharge. In many villages, the river is natural toilet.

Rehabilitation Program

Shanghai government started to rehabilitate local aquatic ecosystem.

- Move those highly polluting factories such as paper mill, printing house and chemical factory.
- Set up specific sewage disposal plants to treat waste water from factories.
- Remove sediments in the river bed.
- Remove solid wastes along rivers and clean up the site.
- Improve the sight of river bank. Set up public parks and green space.
- Conduct environment protection propaganda to rise public awareness.

Achievements

- Huangpu River and its creeks become more clear.
- The smelly smell is eliminated.
- A green space is setup along river bank.
- The quality of water basically meet the requirement for sight view.
Challenges

- Rainwater pipes and waste water pipes are not completely separated. The waste water inevitably runs into river by rainwater pipes.
- Difficult to control "non-spot" pollution sources such as municipal waste thrown into river.
- The whole aquatic ecosystem do not completely recover because of the previous very severe pollution. There are few living animals, like fish or shrimp, in rivers.

References