

# Asian City Water Issues

## Tokyo, Japan and Beijing, China

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## Experience

- Designer for Hydraulic Facilities including Hydraulic Gates, Trash Remover, etc
- Used for water discharge, water intake, flood control, and irrigation
- Contribution to the Construction in Singapore and Indonesia



Source:  
<http://www.hokoku-kogyo.co.jp/>

## Tokyo (capital)

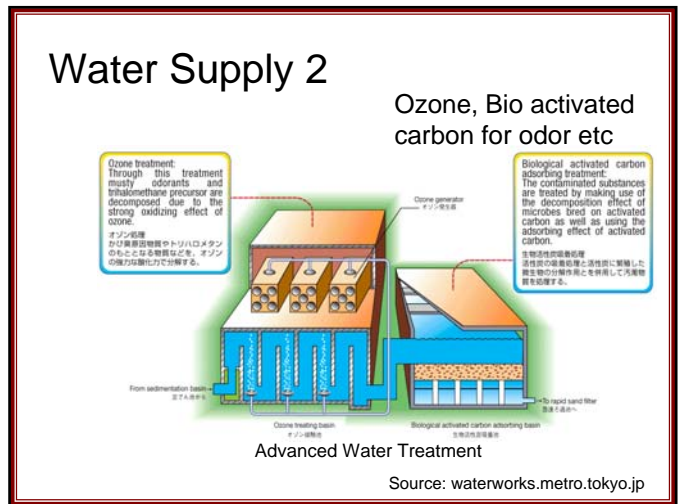
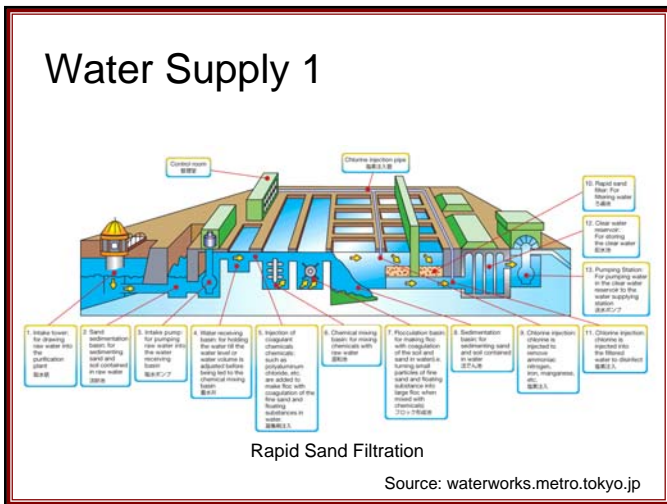
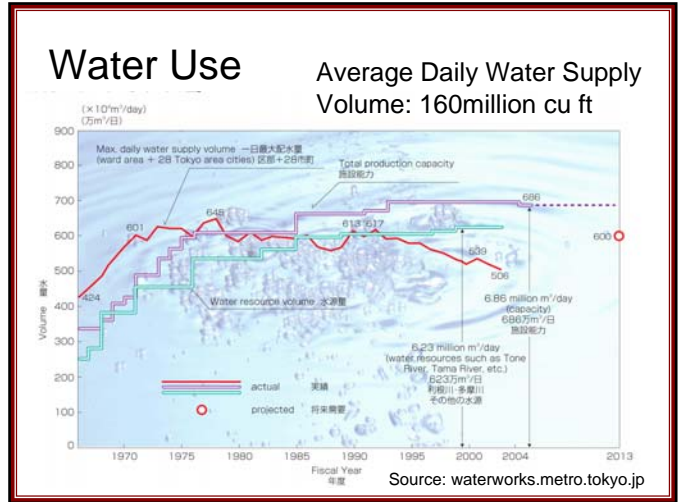
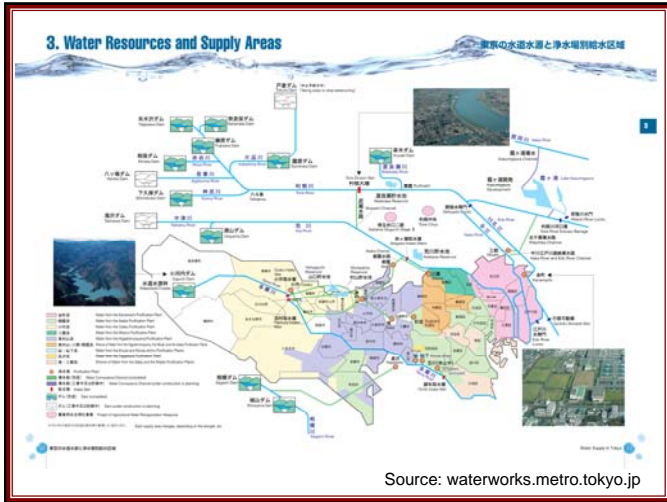
- The most expensive place to live by Oslo (1992-2005) "Priciest City in the World" NY ranked 27
- 12 Million People
- 6735/sq mi (402/sq mi NY)
- Same latitude as Los Angeles, mild winter with low humidity, occasional snow. High temperatures and humidity for summer ,rainfall of about 59 in



GDP \$1191 billion  
(\$1133 NY)  
(54 in Tuscaloosa)

## Tokyo City Picture (source: google.com)





# Water Quality

Items 項目	Units 単位	National Water Quality Standard 国の水質基準	Limit 限度	Objectives 設定する目標		Problem Areas Reasons 課題箇所の理由	
				Target value 目標値	Specifics 目標値の留意		
Odor におい	Residual chlorine 残留塩素	mg/l	1.0(MAX) 0.1(MIN)	0.4(MAX) 0.1(MIN)	Most people don't notice chlorine (ほとんどの人が塩素の臭いを感じない)	Chlorine is included in the water due to disinfection. When too much is included, the water tastes bad (消毒のため塩素が含まれているが、多量に含まれていると不快な臭いを感じさせる)	
	Chlorinous odor カルキ臭	—	—	Under consideration 検討中	Most people don't notice chlorinous odor (ほとんどの人がカルキ臭を感じない)	Chlorinous odor is the main factor of complaint to the water according to questionnaire survey to customers (顧客アンケート調査などで水道水の不快感の要因として最も多く挙げられている)	
	Threshold odor number (TON) 臭気強度	—	3(MAX)	2(No odor) (臭気なし)	1	People don't notice abnormal odor except chlorinous odor (臭気を感じない)	It is indicated by algal odor and earthy odor, etc. (藻臭や土臭味を示す指標)
	2-Methylisoborneol (2-MIB) 異臭物質	ng/l	10(MAX)	10(No odor) (臭気なし)	0	People don't notice musty odors. (カビ臭を感じない)	There are musty odors. (カビ臭の元となる物質)
Taste 味	Organic substances (Total Organic Carbon) 有機物質 (TOC)	mg/l	5(MAX)	5(No odor) (臭気なし)	1(No odor) (臭気なし)	People don't notice a bad taste. (不快な味を感じない)	It is indicated by the concentration of organic substances in the water. When too much is included, the water tastes bad (水中に含まれる有機物の濃度を示すもので、多量に含まれると不快な味を感じる)
	Color 色度	degree	5(MAX)	5(No odor) (臭気なし)	1(No odor) (臭気なし)	People don't notice that the water is hazy or discolored (濁りや色づきを感じない)	It is indicated by the degree of color of the water. (色づいている色の程度を示す指標)
Appearance 外観	Turbidity 濁度	degree	2(MAX)	2(No odor) (臭気なし)	0.1(MAX) 0.1(No odor) (臭気なし)	People don't notice that the water is hazy or discolored (濁りや色づきを感じない)	It is indicated by the degree of turbidity of the water. (水の濁りの程度を示す指標)

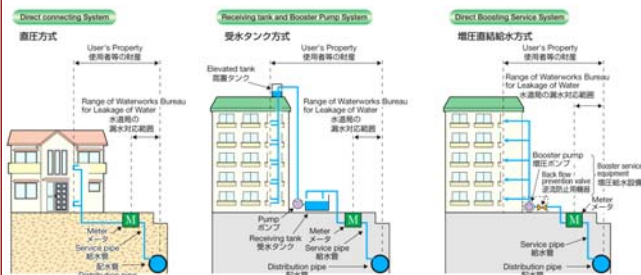
Source: waterworks.metro.tokyo.jp

# Water System

Source: waterworks.metro.tokyo.jp



# Water Distribution



Source: waterworks.metro.tokyo.jp

# Drainage System

five 32m diameter, 65m deep concrete containment silos, connected by 64 kilometers of tunnels 50 meters deep underground. The system is powered by 14000 horsepower turbines which can pump 200 tons of water a second into a nearby river.



Source: allmightys.com

## Drainage System



Source: allmightys.com

## Beijing (capital)

- The most unhealthy capital to live by SEPA 2006
- 15 Million People
- 2686/sq mi (402/sq mi NY)
- Almost same latitude as Detroit, cold, windy, and dry. China dust storm is a serious problem, rainfall of about 24 in



GDP \$99 billion  
(\$1133 NY)

(54 in Tuscaloosa)

## Beijing Picture (source: google.com)



Source: NHK Jilu Zhongguo



Source: NHK Jilu Zhongguo



**Car wash for 80 cents/once!?**

Source: NHK Jilu Zhongguo

## Water shortage

- Olympic Game in Beijing, 2008
- Life Style Change for Chinese
- Contamination of water sources including the surface and the ground water
- Population growth (4 million per year)
- 95% of water is used for industries by U.S. Embassy of Beijing
- 43% of pipes are broken or leaking

## Water Quality

- 50% of lakes are below the Grade V Standard
- 8 of major rivers fail to meet the Grade V Standard
- Cd, Hg, Pb, and Zn exists in below Grade V quality standard and Grade IV quality standard

Source: Beijing Municipal Environmental Protection Bureau

## Rain Making



Source: NHK Jilu Zhongguo

## National Project 1300 km water delivery



Source: NHK Jilu Zhongguo

## Conclusion

- Japan needs a dam to store the water
- Tokyo has a huge underground drainage system
- China is struggling to get water
- China needs to improve environment

Thank you for your time  
and patient