

Urbanization and environment: Japan's experience

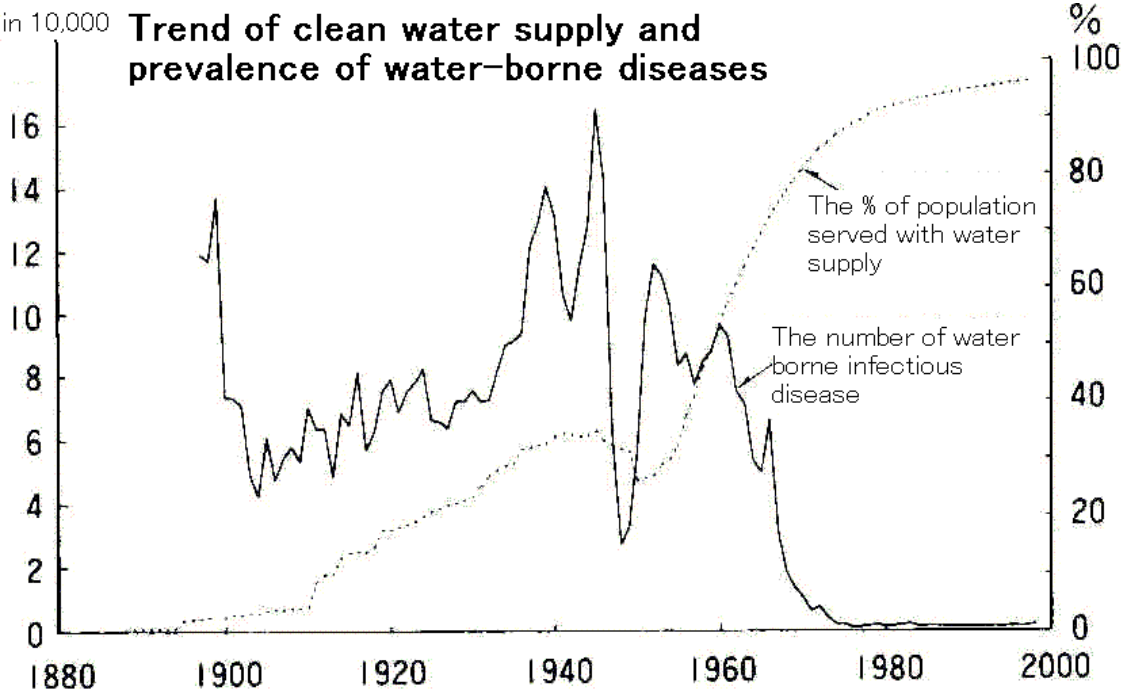
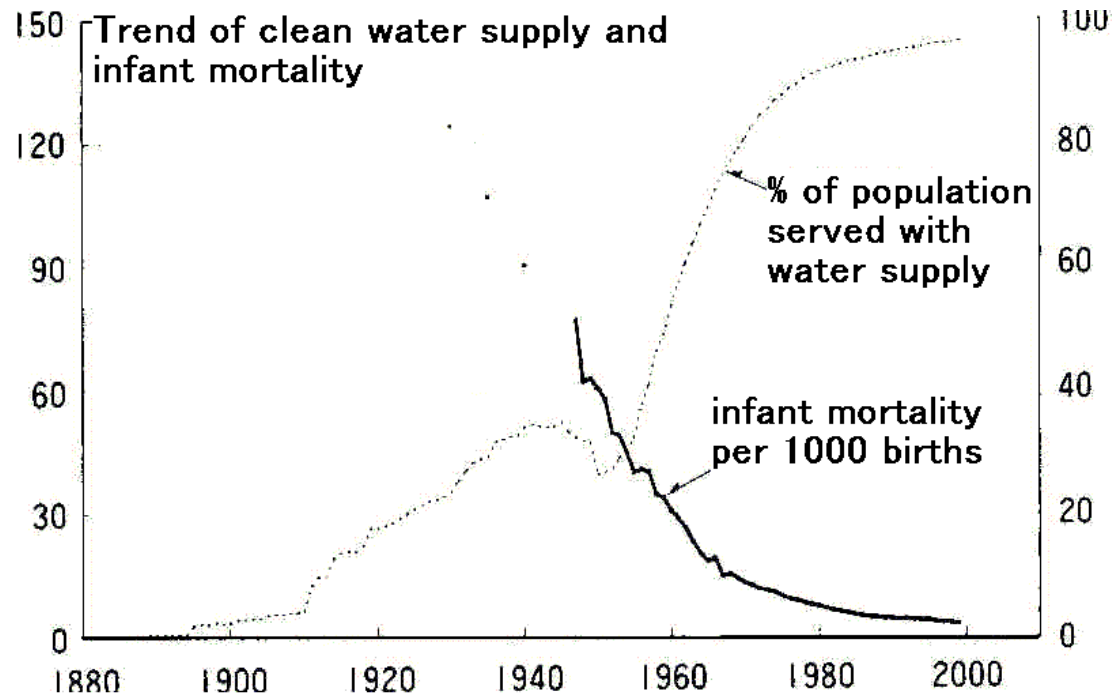
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Water supply

- Japan faced with the challenges of urbanization since as old as the Edo era (1600-1867), when the population of the capital Edo (now Tokyo) grew to as many as two million population.
- According to an estimate, the Edo residents with supply of fresh water was 1.2 million out of two million in 1787.
- At that time already, the size of Tokyo's water system was arguably the largest of the world (in comparison, the population supplied with fresh water was estimated to be approximately 900,000 in London and 700,000 in Paris).
- Supply of safe drinking water might explain why Edo was relatively free from food-borne infectious diseases.

Trend of clean water supply and disease prevalence and IMR



Sewage system

- With respect to sewage system, Japan lagged behind European cities which had chronically suffered from epidemics of food-borne infectious diseases. The first sewage system was constructed in Tokyo in 1884 but failed to cover the entire country up until recently (the latest figure of the sewage coverage is 71.7% in 2007). Although the sewage coverage is far from being complete, the recycling of sewage waste for the use of construction material and composts was 74% in 2006, a fairly good performance in the world standard.
- With respect to disposal of human waste and excrement, 90.7% of the total population is served with sanitary toilets (23.3% served with septic tanks and 67.5% is served with sewage system). However, the rest 9.3% of population is still left with no toilets, most of whom receive regular collection of human waste and excrement by collection “vacuuming” cars. Approximately 1% of population has to dispose their excrement by themselves.

“Vacuuming car”

- invented in 1951 and commonly used where no sewage available.
- Yokohama city rented nine vehicles to Indonesia in 2004 as relief activities of Tsunami



Tokyo garbage war (early 1970s)

<http://www.rikkyo.ne.jp/web/z5000002/p1000/07-ensyuu/07-ensyuu-04/yumenoshima-siryou.html>



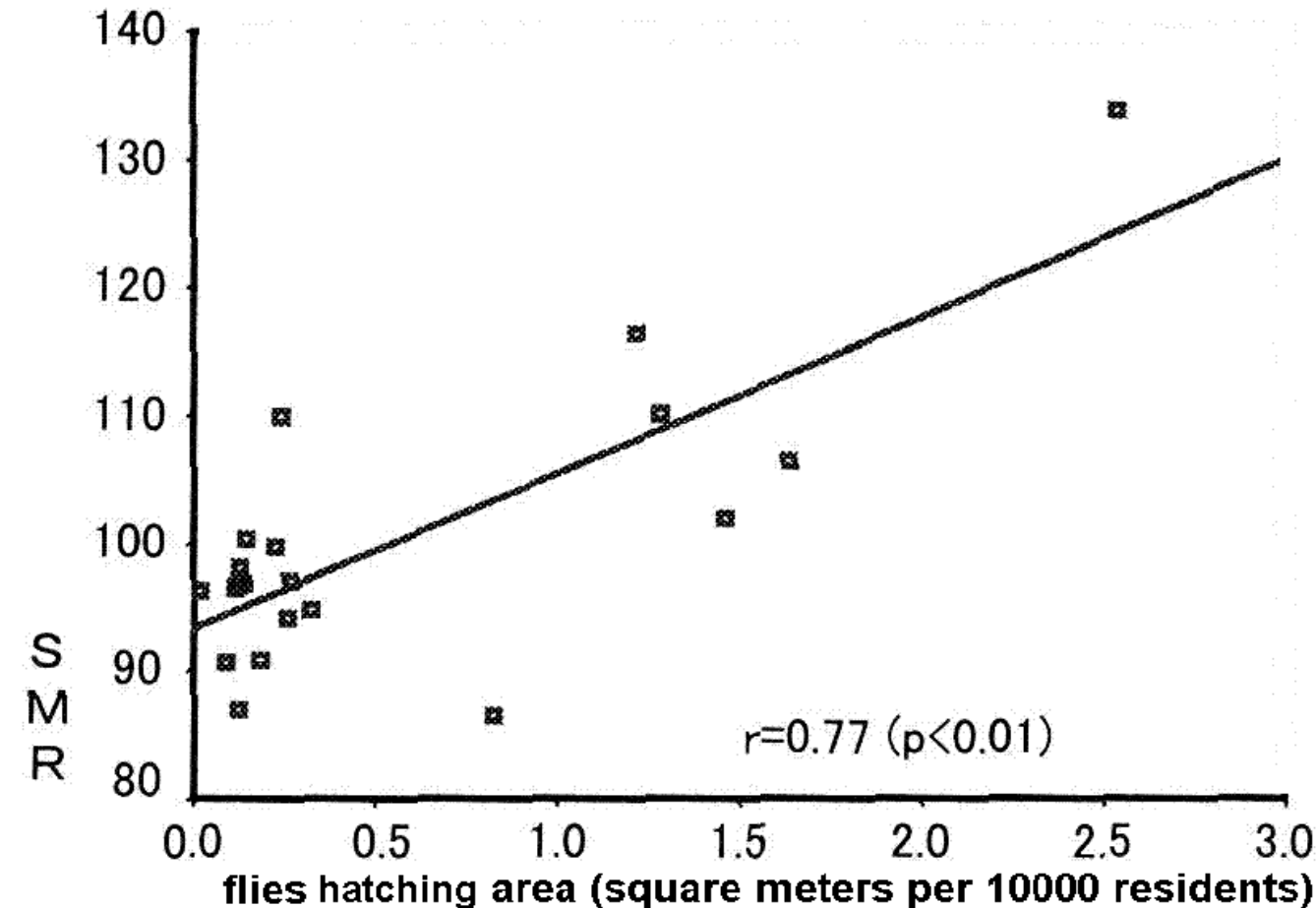
Garbage from Tokyo 23 wards was dumped to “Dream Islands” of Koto ward hatching massive flies. Angry local residents stopped garbage cars from outside



Flies and SMR: evidence from Osaka

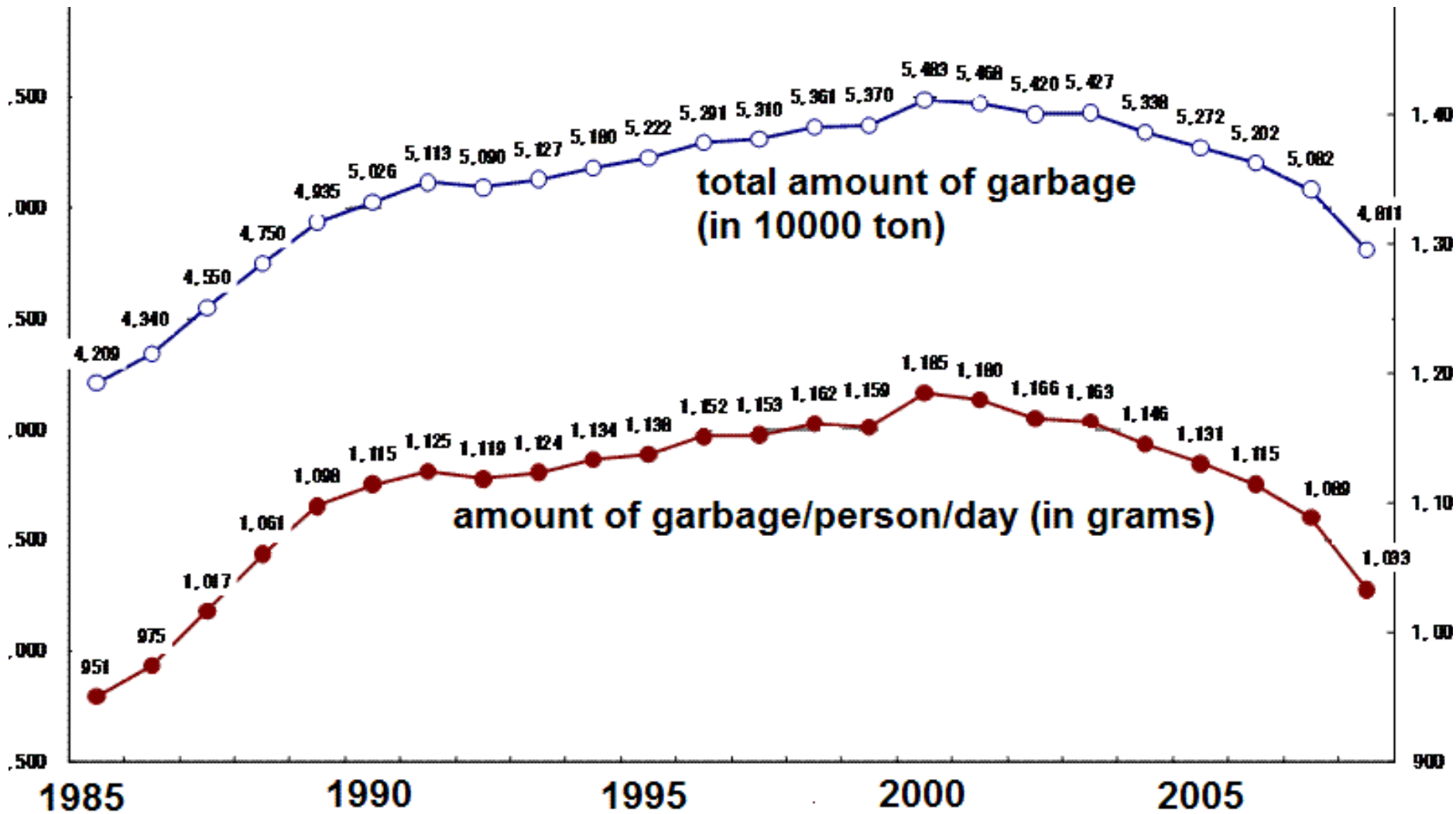
Osaka 20 wards

Relationship between SMR and flies generating area (1985, Osaka 20 wards) Tatara K. Toward healthy cities. J of Municipal Problems 1992;44(5):3-18.



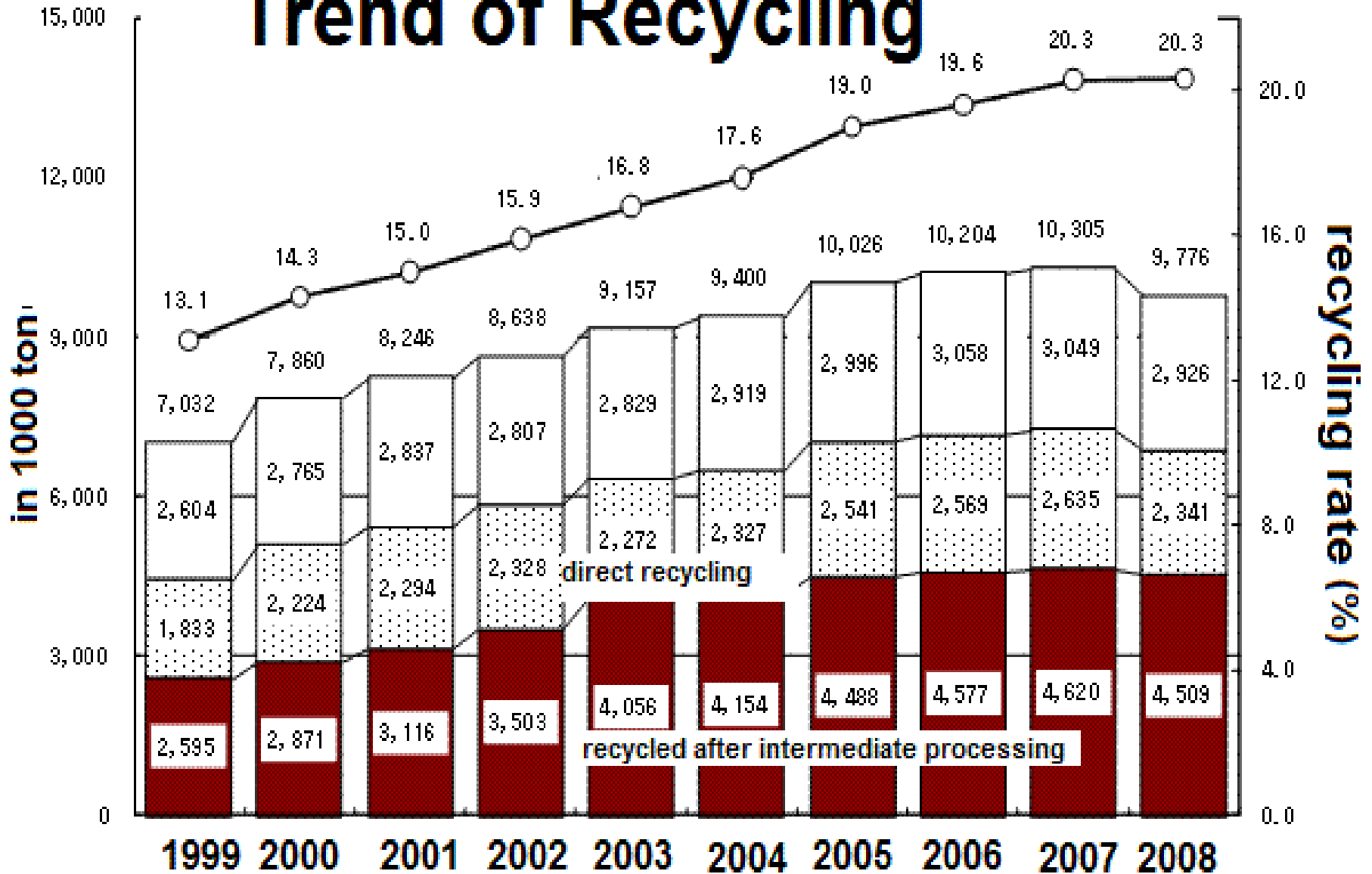
Resources if classified, garbage if mixed

A slogan for selective collection

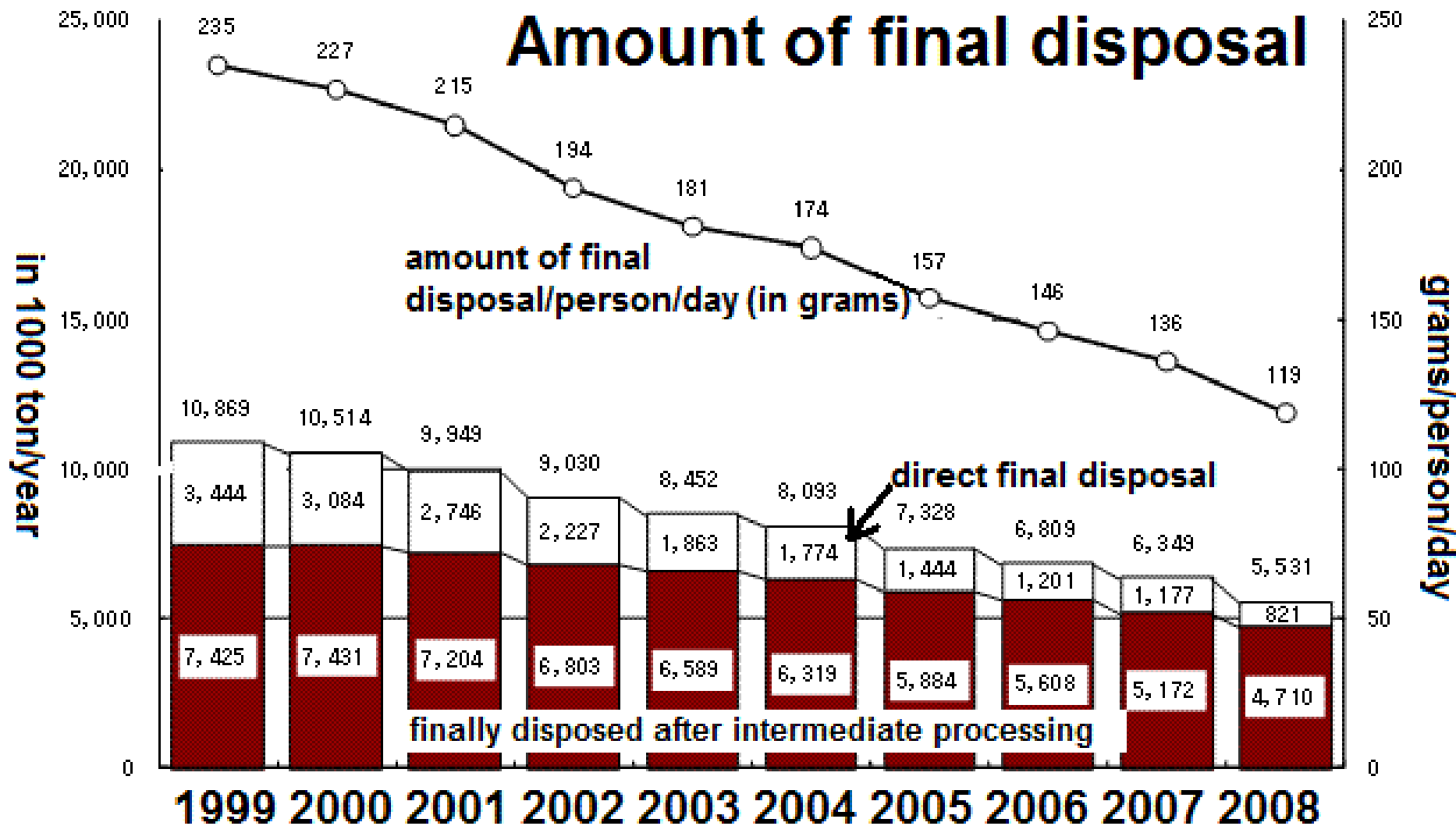


Recycling

Trend of Recycling

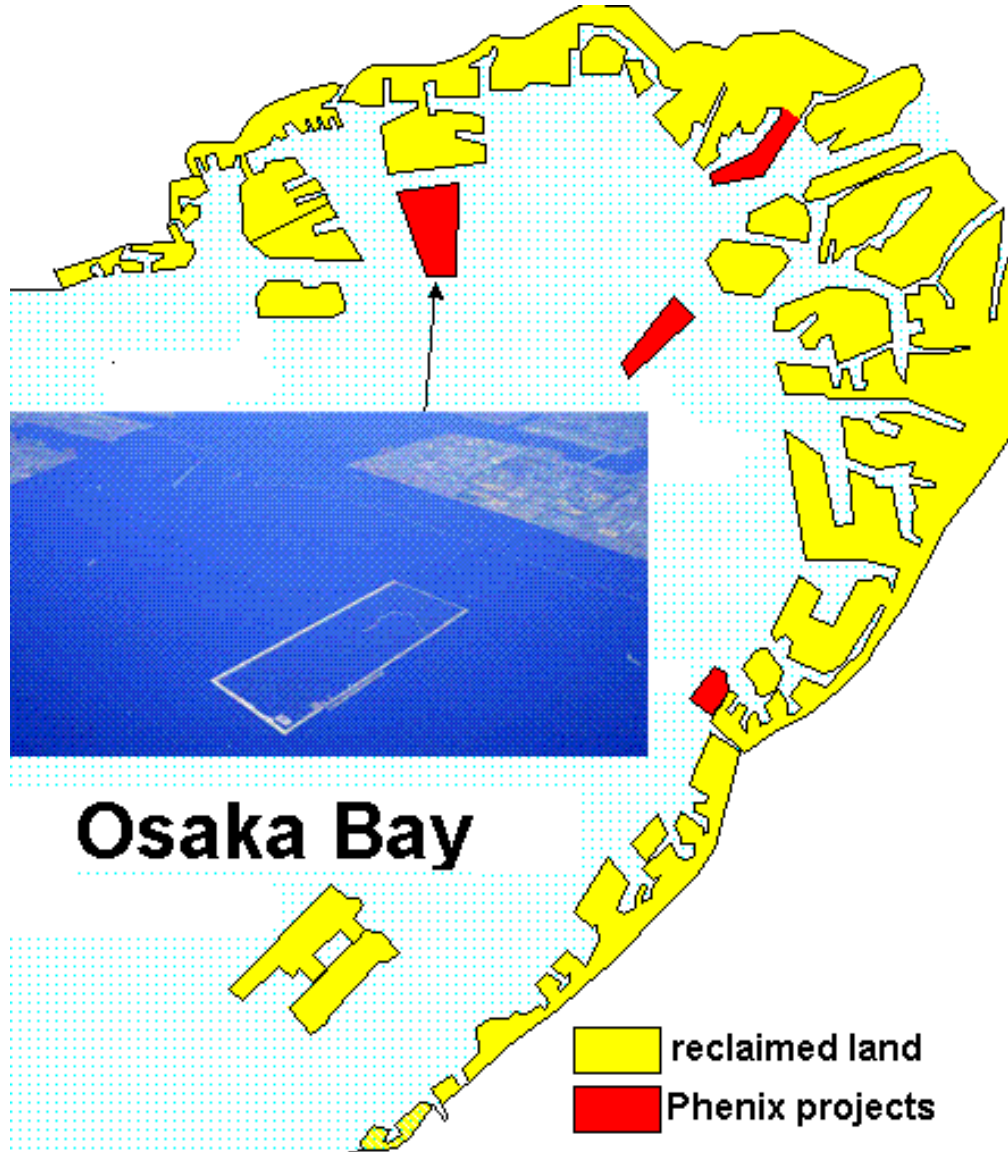


Preserving final disposal sites

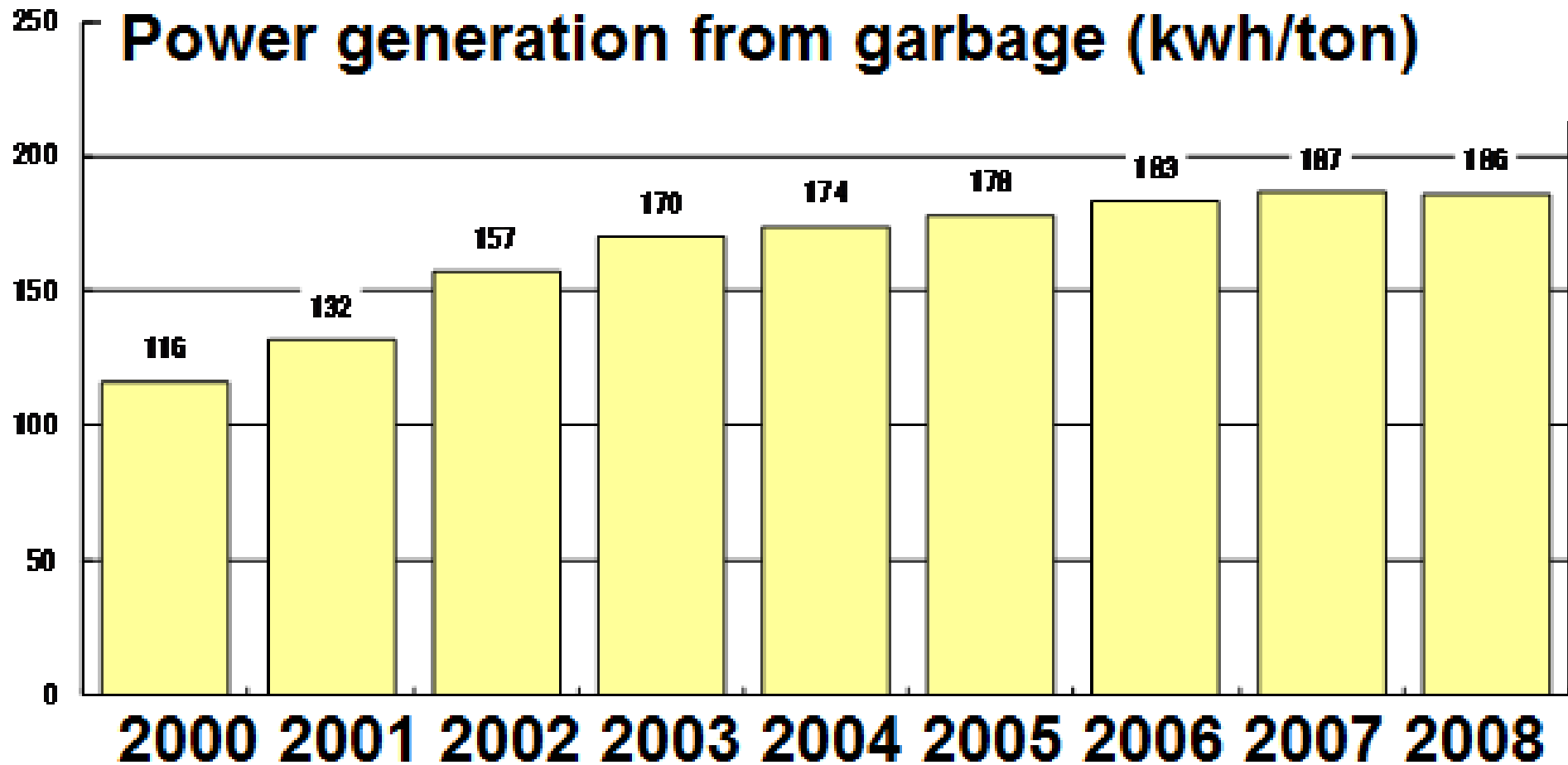


Phenix projects

Wide Bay-side Disposal Act (1981)

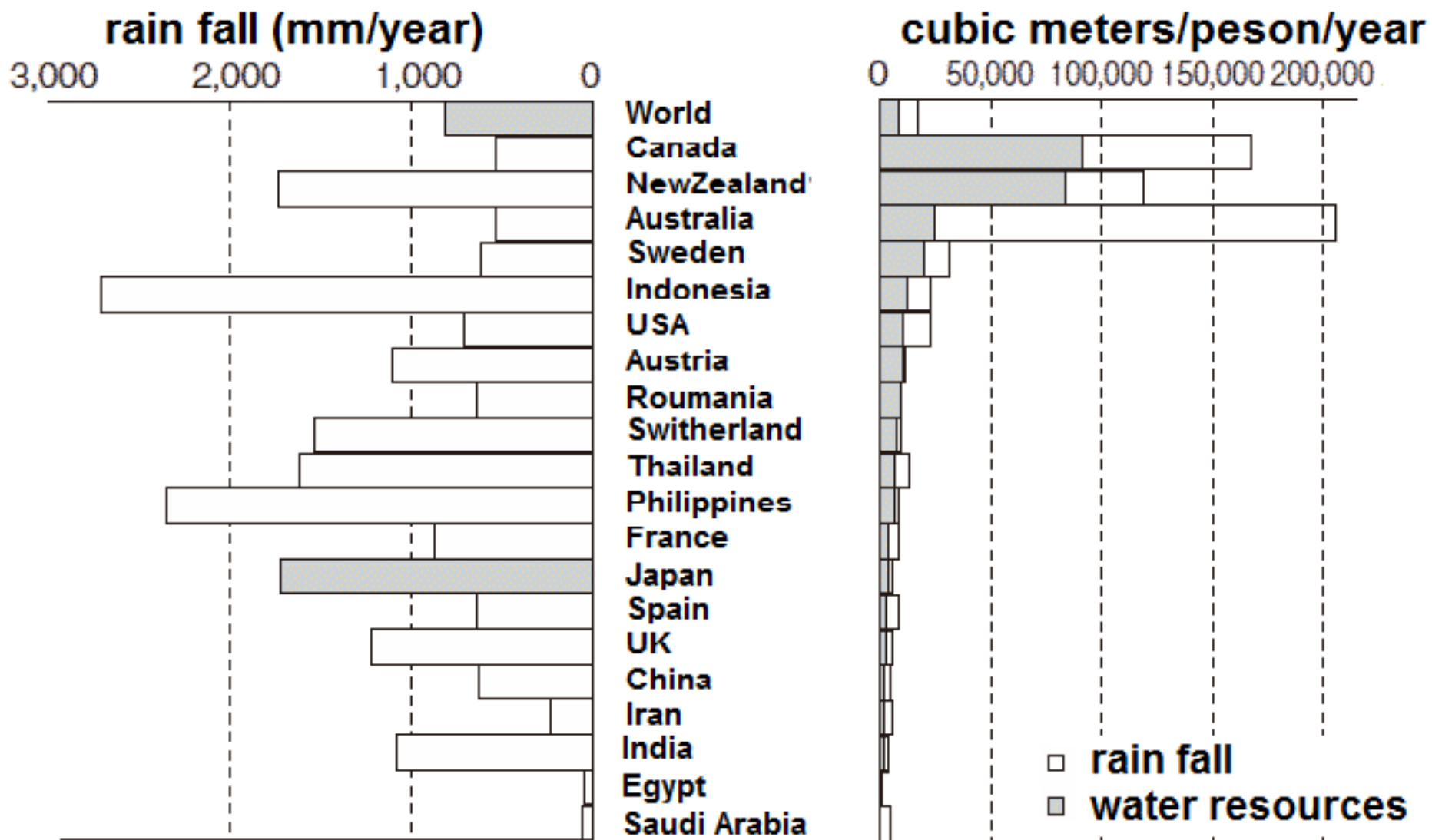


Garbage plants



Future challenges

Much rain but little per person



(注) 1. FAO (国連食糧農業機関) 「AQUASTAT」 をもとに国土交通省水資源部作成

Conclusions

- Historically, urbanization and concentration of population brought about worse sanitary conditions. Japan's cities were relatively free from diseases thanks to safe water supply and sanitary disposal of human excrements.
- In the modern era, garbage disposal caused local conflicts and had to be dealt with community recycling efforts. Currently garbage is considered to be “resources” providing new land and energy.
- Given the increasing demand for water, securing rain falls will be a limiting factors to support urban population particularly in Asian countries.