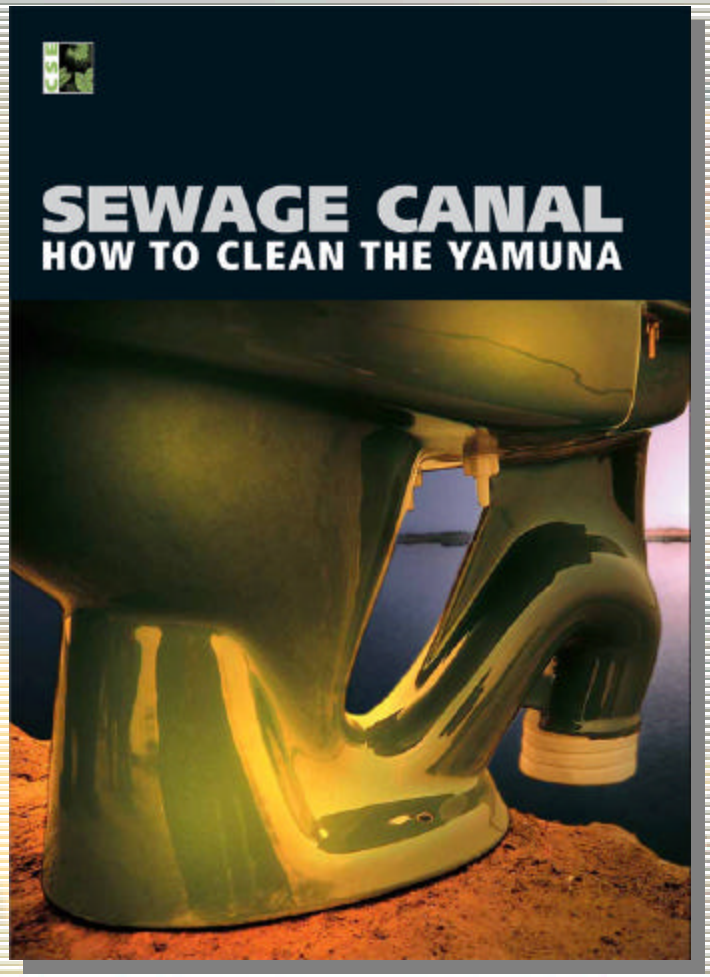
Sewage Canal: How to Clean the Yamuna



Sewage Canal: How to Clean the Yamuna

The tale of Delhi, its river, its water and its excreta…

Making the connections to clean the river

Sewage Canal: How to Clean the Yamuna

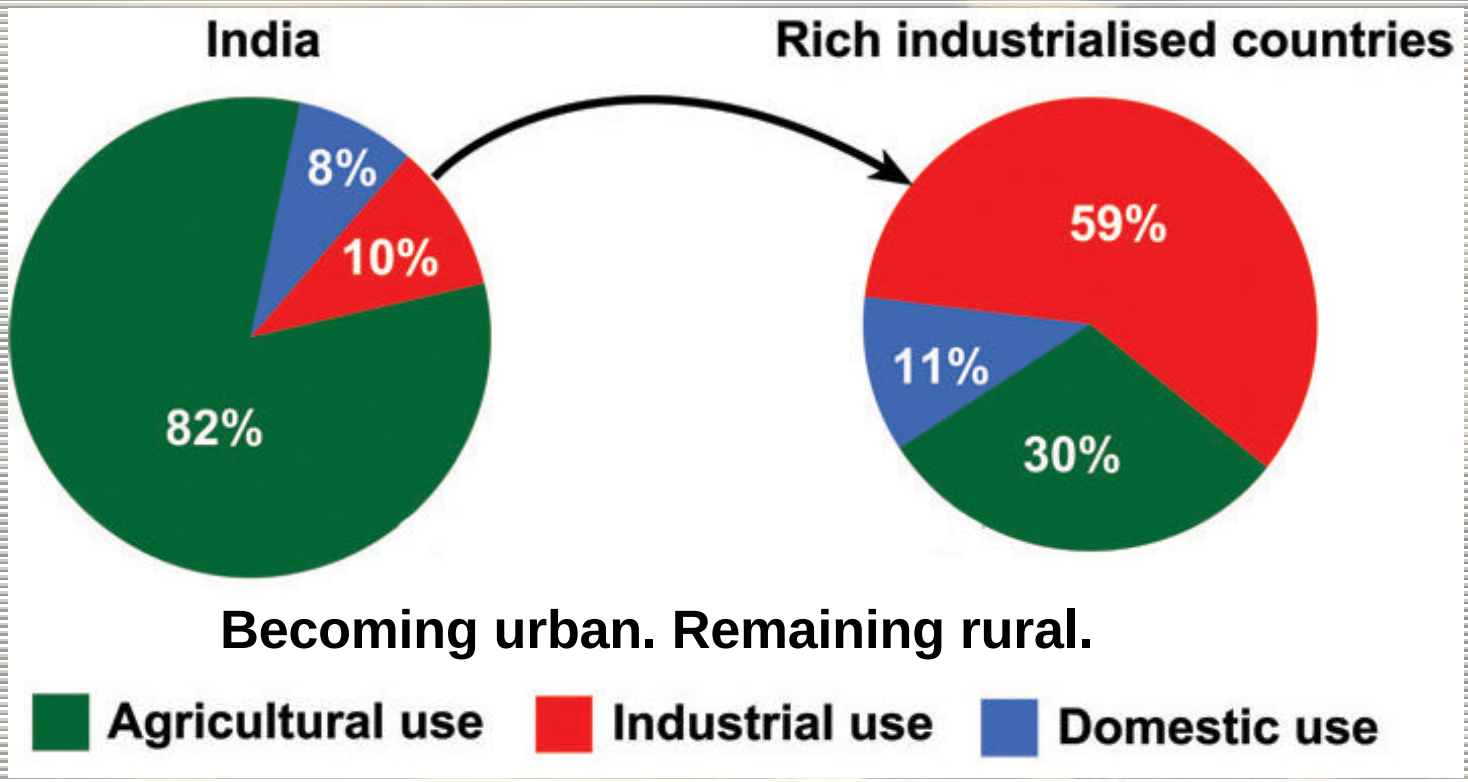
About Yamuna. But not just Yamuna

- **Every river, every lake, every water body getting polluted. Full of our sewage.**
- **We take water, return sewage.**
- **80% of water leaves as sewage**
- **Cities are growing, need more water, discharge more pollution.**
- **Dirty water means ill health: biggest cause of children's death.**

Be angry. Not acceptable.

Sewage Canal: How to Clean the Yamuna

Water wars within



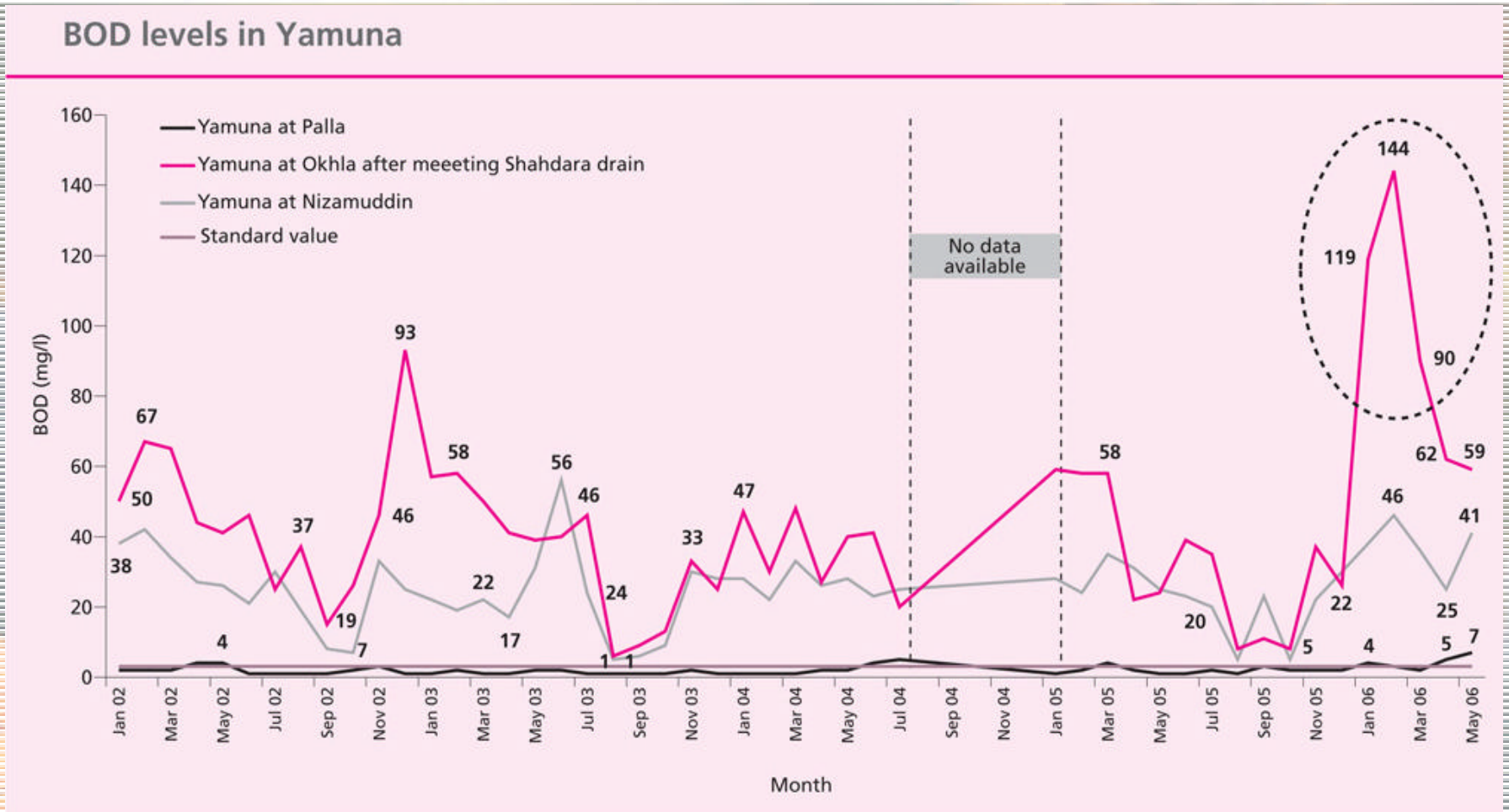
Pollution will add to water stress. Cannot allow it.
Have to build cities without pollution.

Sewage Canal: How to Clean the Yamuna

22 Km stretch in Delhi contributes 70 per cent of the total pollution load of the river

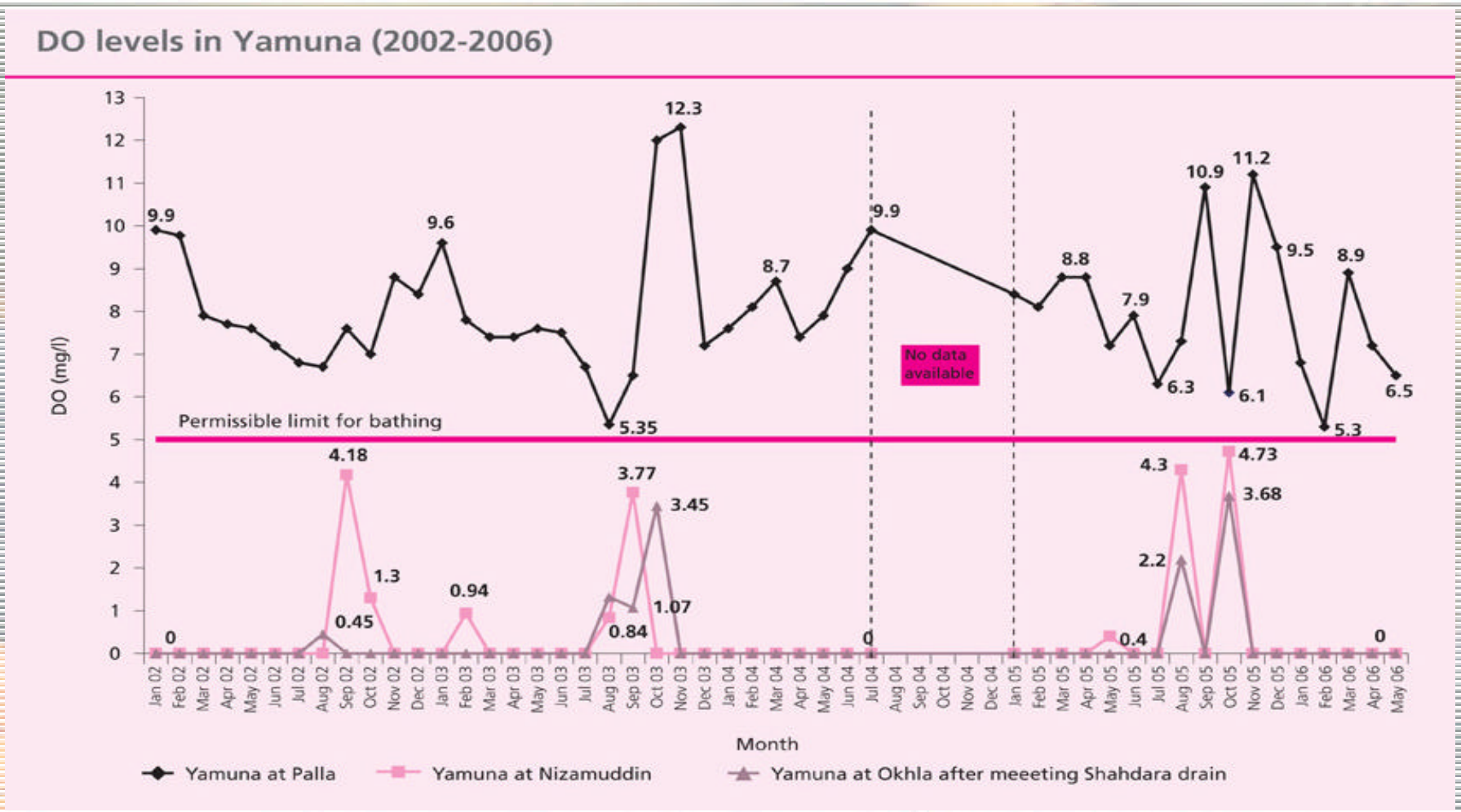
Sewage Canal: How to Clean the Yamuna

Yamuna a dirty drain of Delhi (BOD levels)



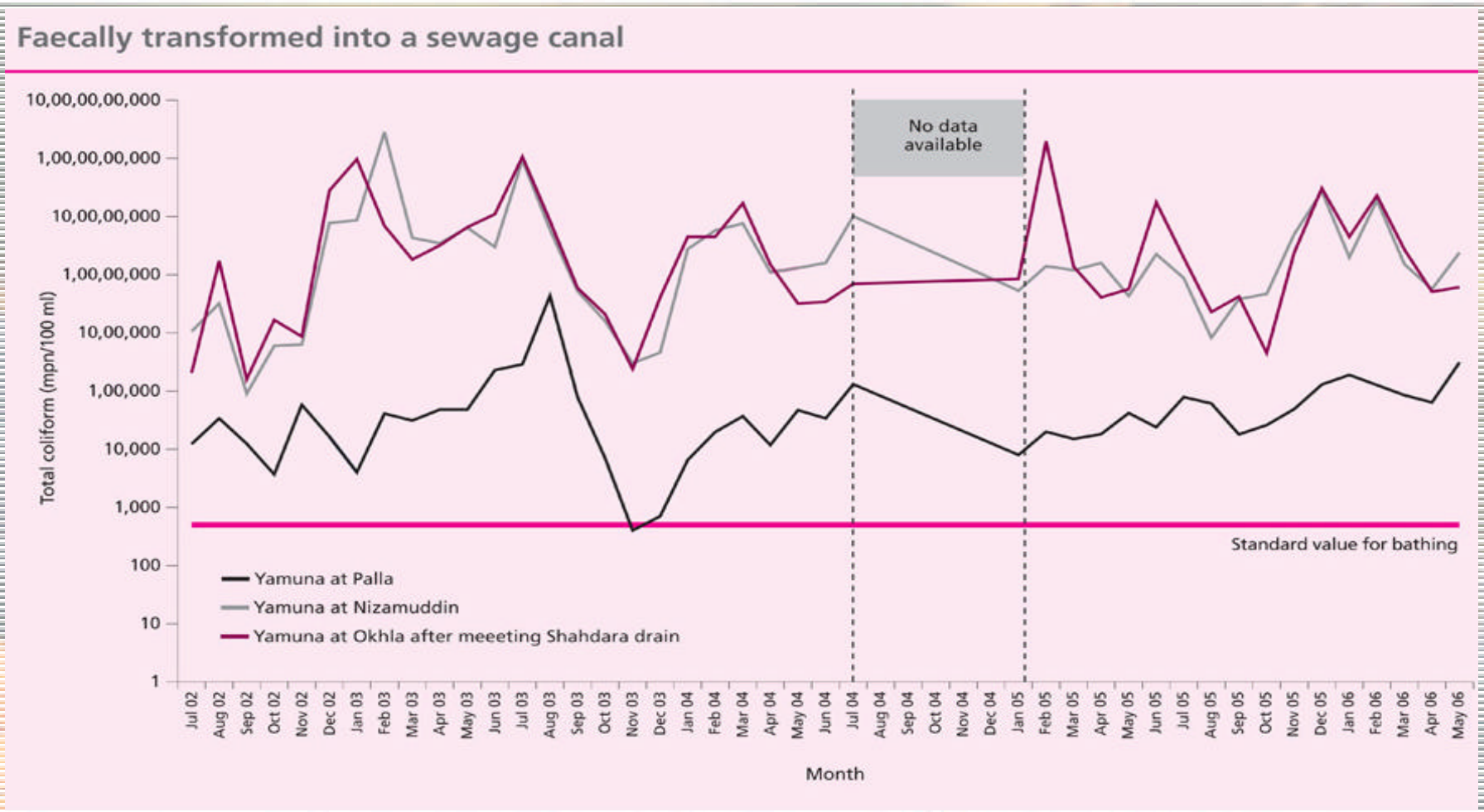
Sewage Canal: How to Clean the Yamuna

DO levels: Yamuna is dead.



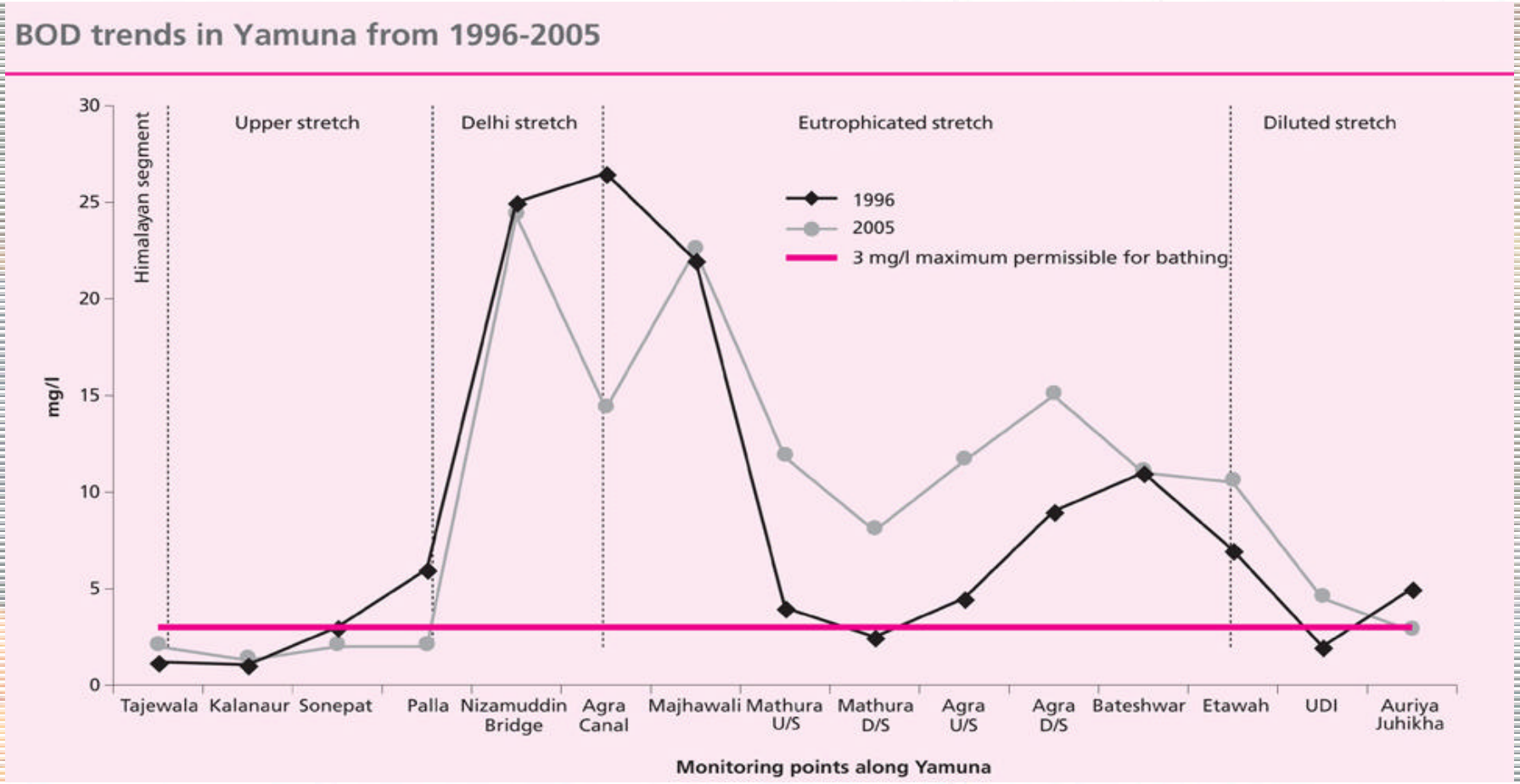
Sewage Canal: How to Clean the Yamuna

Faecal Coliform: our sewage



Sewage Canal: How to Clean the Yamuna

We all live downstream: what we do to the river; others will do the same



Sewage Canal: How to Clean the Yamuna

Funds spent, programmes implemented

- **By 2006**

17 sewage treatment plants built;
10 common effluent plants built;
30 km of trunk sewers repairs (out of 130 km)
Slums removed from riverfront
Low-cost toilets built

Sewage Canal: How to Clean the Yamuna

Money spent

Money down the drain

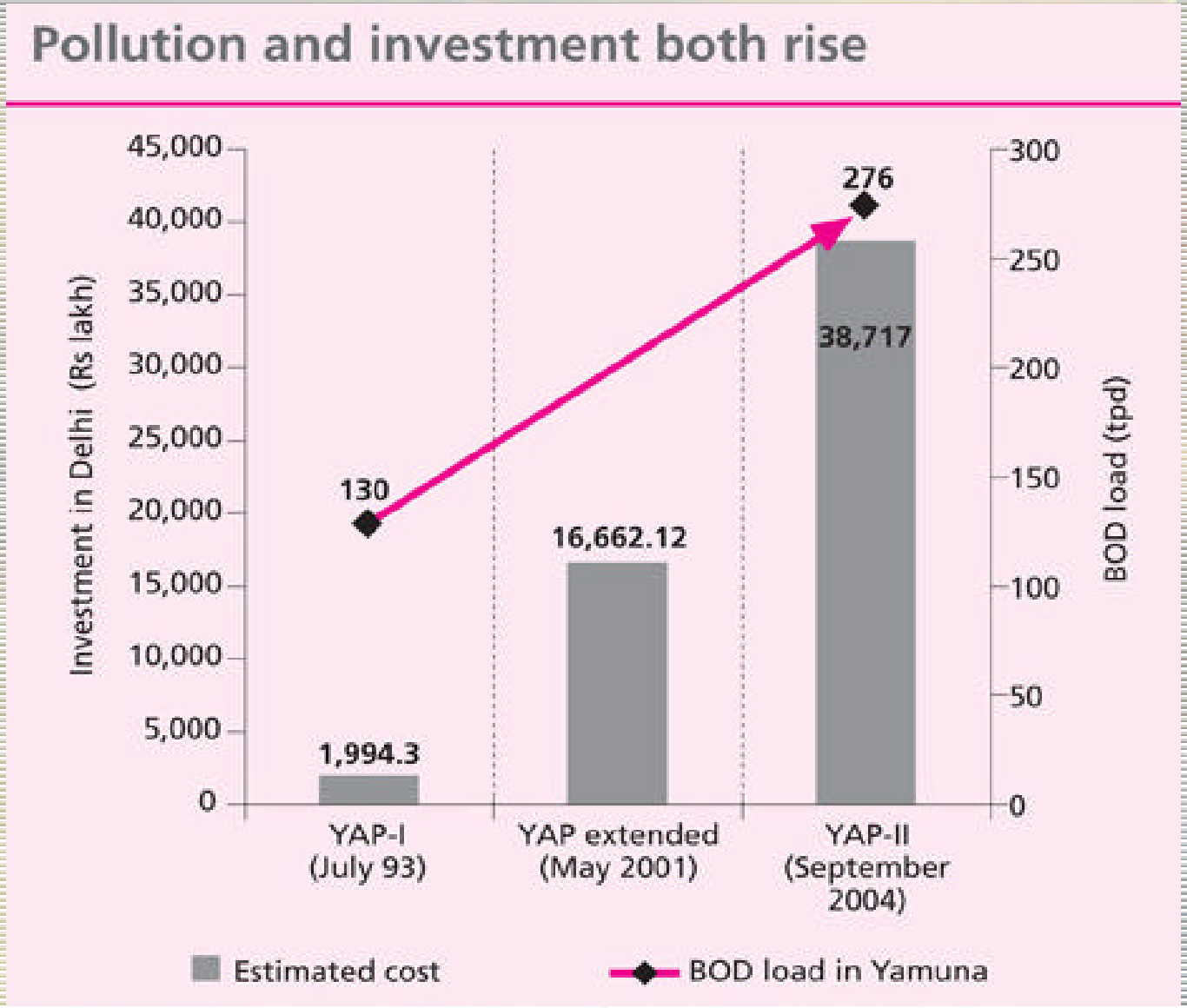
Capital investment to clean Yamuna	Rs crore
YAP-I (spent in Delhi)	19.94
YAP extended (in Delhi)	166.62
17 STPs with a capacity 2,330 mld[1]	745.6-1,048.5
15 common effluent treatment plants	256
Total	1,188.16-1,491.06

Sewage Canal: How to Clean the Yamuna

Balance sheet

input: funds

output: pollution



Sewage Canal: How to Clean the Yamuna

Not about pollution. It is about sewage

- We discuss pollution because it is modern and somehow touchable.
- We do not discuss human excreta and its disposal. That is an untouchable subject.
- **Flush and forget mindset**
- Drains will carry it. Somebody will treat it. Somebody will build sewage treatment plant. Clean it. Dispose it.
- Don't care. Yamuna is polluted **not** because of us

But it is about us: our water; our sewage

Understand the political economy of defecation

Sewage Canal: How to Clean the Yamuna

Current system: bring water (from distance); treat, pump, pipe to home, take sewage, pump, pipe, treat and dispose…river will be clean

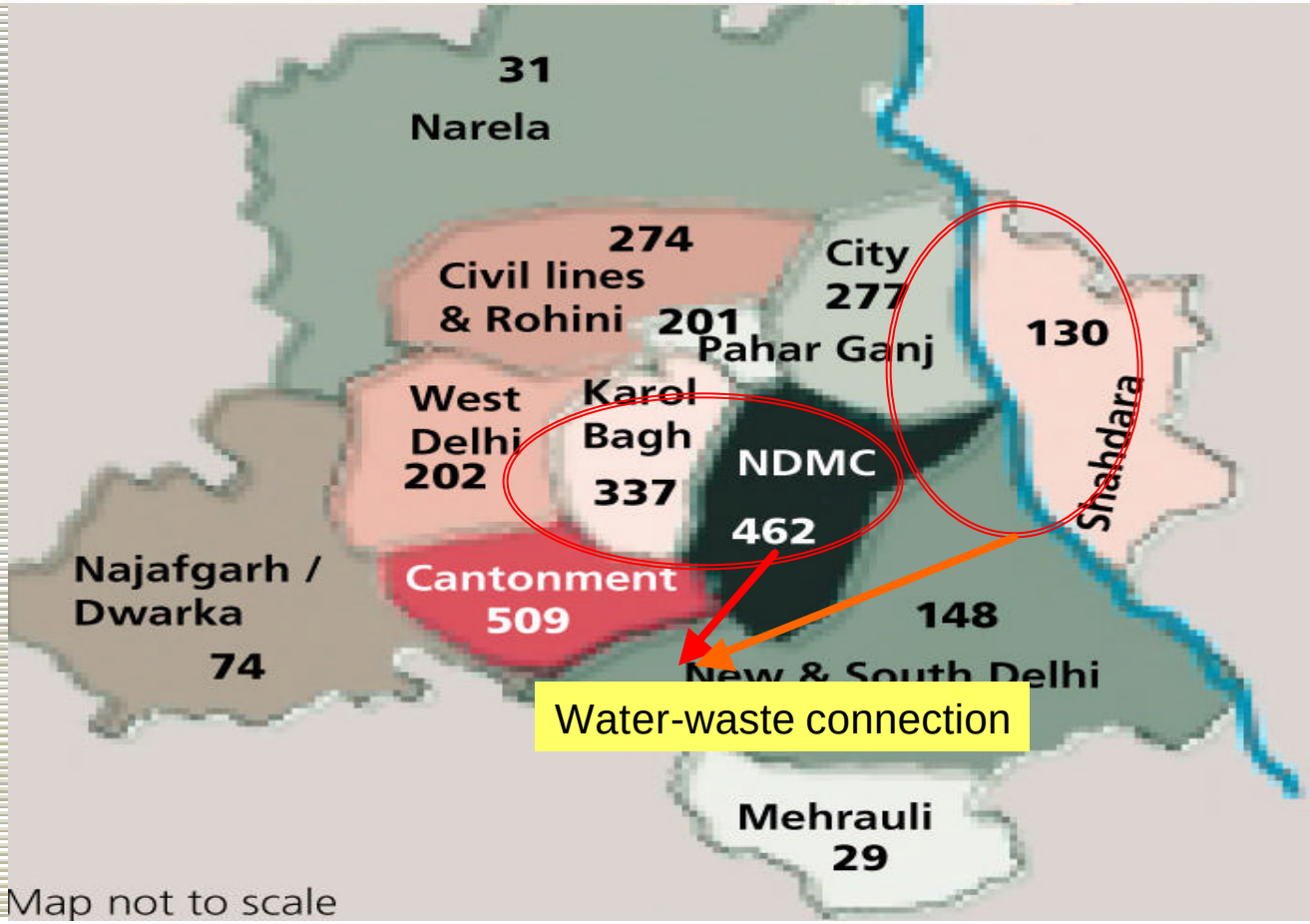
- **Should work. But:**

a. **It is capital intensive – creates divide between the rich and poor in a city. The state can subsidise some but not all. Subsidises rich**

b. **It is resource intensive – uses water, creates waste. Adds to stress.**

Sewage Canal: How to Clean the Yamuna

Political transportation costs are high.
Distribution costs high. Cannot be recovered.
Subsidy to some. Water inequity in Delhi.



Sewage Canal: How to Clean the Yamuna

Arithmetic of excreta

- **The more water we use = the more waste we generate**
- **The more waste we generate = more money to collect, to convey, to treat and to dispose**
- **The more waste we do not treat = polluted water and increased burden of health costs**

Sewage Canal: How to Clean the Yamuna

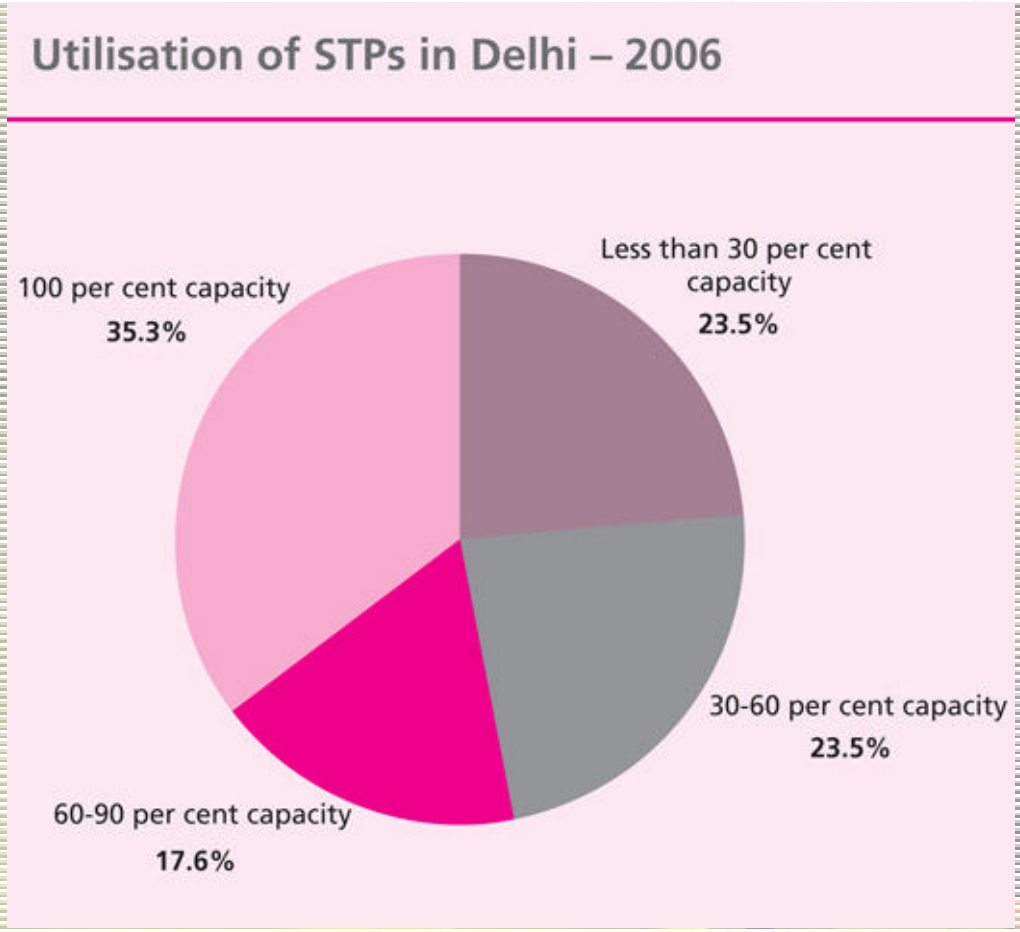
If STP was the answer, pollution in Yamuna not a problem

- India has installed capacity to treat roughly **20%** of excreta it generates

- Delhi has **40%** of India's installed capacity
- **17** STPs: can treat **2330** mld of waste
- Delhi generates 2,500 mld (DJB) or 3,700 mld (CPCB)
- Can treat: **93%** or **62%**
- But..

Sewage Canal: How to Clean the Yamuna

Underutilised: where there is waste; no STP; where there is STP; no waste



Sewage Canal: How to Clean the Yamuna

Drainage exists; but does not work. Drainage does not exist; does not work

- **Cannot transport waste to the sewage plant. Sewage plant cannot treat.**
- **5,600 km of drains in city; 130 km of trunk sewers; in poor state.**

Then:

- **Large parts of the city does not have official-underground drainage system**
- **Large parts of the city lives in unauthorised-illegal colonies**

Sewage Canal: How to Clean the Yamuna

Utilised: but mixed with untreated

- **"Illegal or unauthorised or unconnected" but will have excreta**
- **This excreta flows into drains; which carry treated effluents**
- **'Legal' partially treated effluent mixed with 'illegal' untreated effluent**
- **Result: pollution**

Sewage Canal: How to Clean the Yamuna

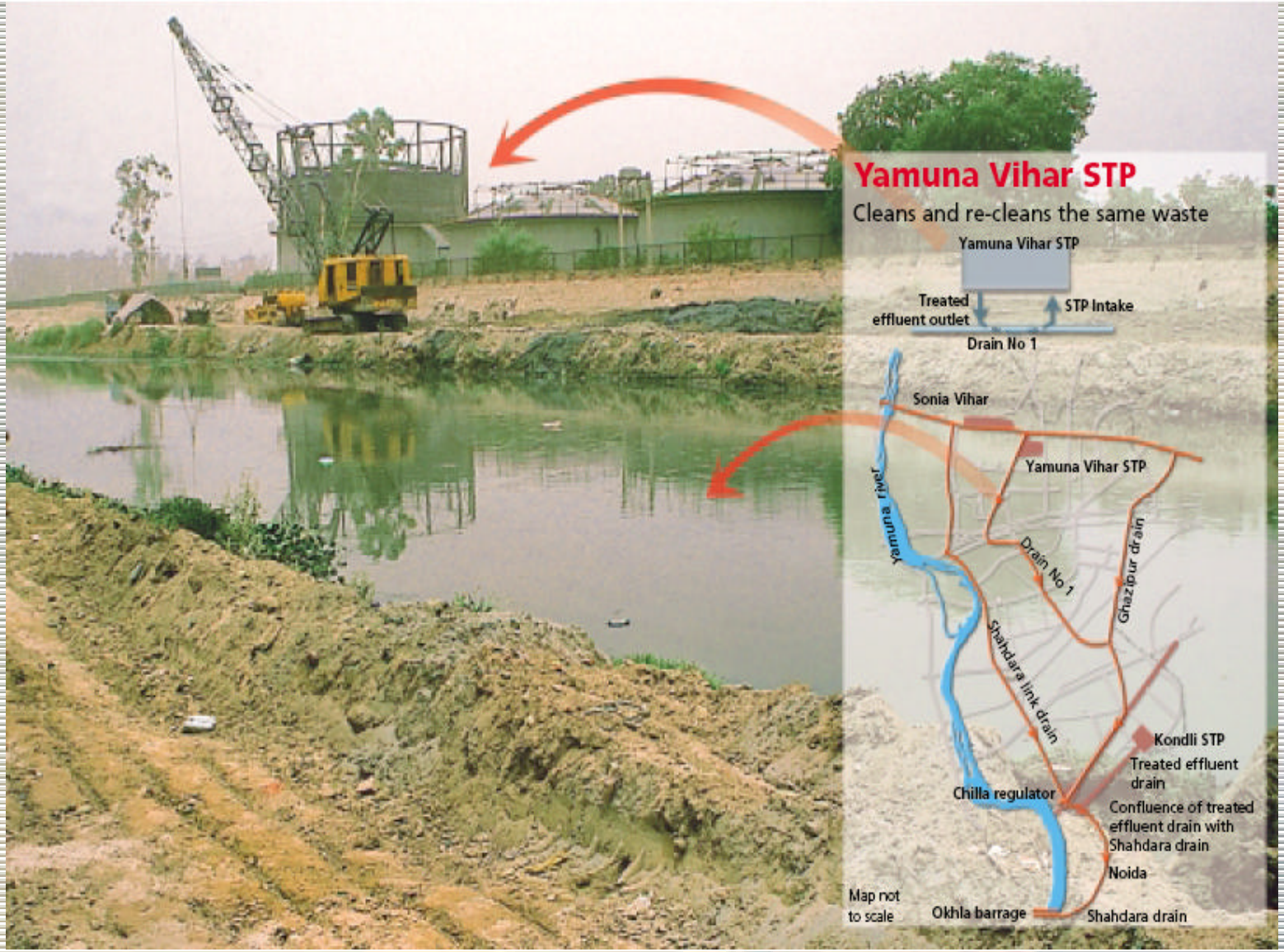
Take
East Delhi
Shahadra drain

Discharges 16% flow
or 20% of BOD load
into Yamuna

2 STPs
Yamuna Vihar: 45+45 mld
treated.
Kondli: 45+45+113 **mld**
treated

Sewage Canal: How to Clean the Yamuna

But



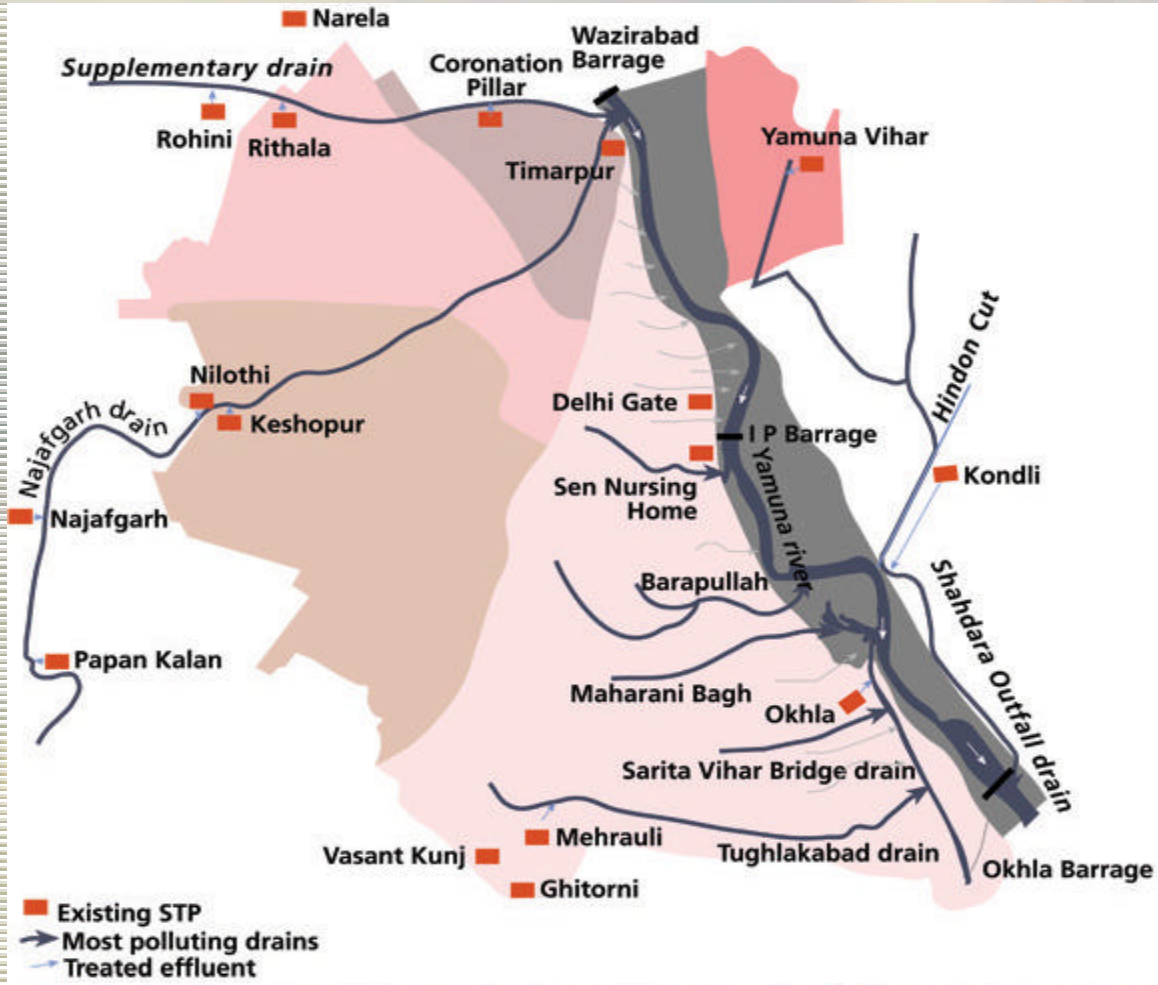
Sewage Canal: How to Clean the Yamuna

But

- **Treated effluents from Yamuna Vihar discharged into drain**
- **Drain carries effluents of un-sewered colonies**
- **Treated and untreated effluent then picked up at Kondli**
- **Treated again**
- **Discharged into drain which carries effluents of unsewered colonies – in Delhi and Noida.**
- **Are we surprised: River stays polluted**

Sewage Canal: How to Clean the Yamuna

Sewage treatment plants located far away from sources. Treated water mixed in same drain. Not reused.



Sewage Canal: How to Clean the Yamuna

Can we pay full cost?

- **It costs Rs 5-6 per 1000 litres to supply treated water to us**
- **We pay Rs 2.20 per 1000 litres**
- **Cost will increase if pollution increases. Upstream cities will do the same as Delhi**
- **Will cost Rs 30-40 per 1000 litres to take back our sewage; treat it; dispose it. (Hardly pay)**
- **Cost will increase as river gets more polluted. No assimilative capacity.**

Sewage Canal: How to Clean the Yamuna

Cost of system is high. Cannot pay. Cannot subsidise all. Only rich.

- **This is the political economy of defecation.**

- **The rich use water. Are connected to sewage system. Waste is collected. Even treated.**
- **But they cannot pay for full costs..**
- **The poor use little water. Not connected to sewage system. Waste flows in open drains. Not treated.**
- **But if system not designed for all. Not affordable by all. Will not work.**

Sewage Canal: How to Clean the Yamuna

The ultimate irony

- **If we don't clean river; pollution increases;**
- **If we don't treat waste; groundwater gets contaminated;**
- **Rich (you and me) move to bottled water**
- **Pay Rs 12 per litre**
- **Poor have no option. Pay with health costs.**

- **Unacceptable. Wrong. Will not work**

Sewage Canal: How to Clean the Yamuna

What do we do?

Think: of Yamuna in Delhi, not of Hudson in New York, not of Thames in London

Think: of software not hardware

All the STPs, all the interceptor drains…will not work.

If we do not understand and rework the way we manage the business of water-sewage

Sewage Canal: How to Clean the Yamuna

1. Treat all sewage

A. Intercept sewage from open drains (not just 'legal' sewage)

B. Use open drains as treatment areas – plan for drains, not just wish them away

C. Maximise the current sewage treatment plants – do not only build new

Sewage Canal: How to Clean the Yamuna

2. Treat but **do not discharge** into drain

- **Once sewage is treated; reuse-recycle so that not added to the untreated sewage in drain**

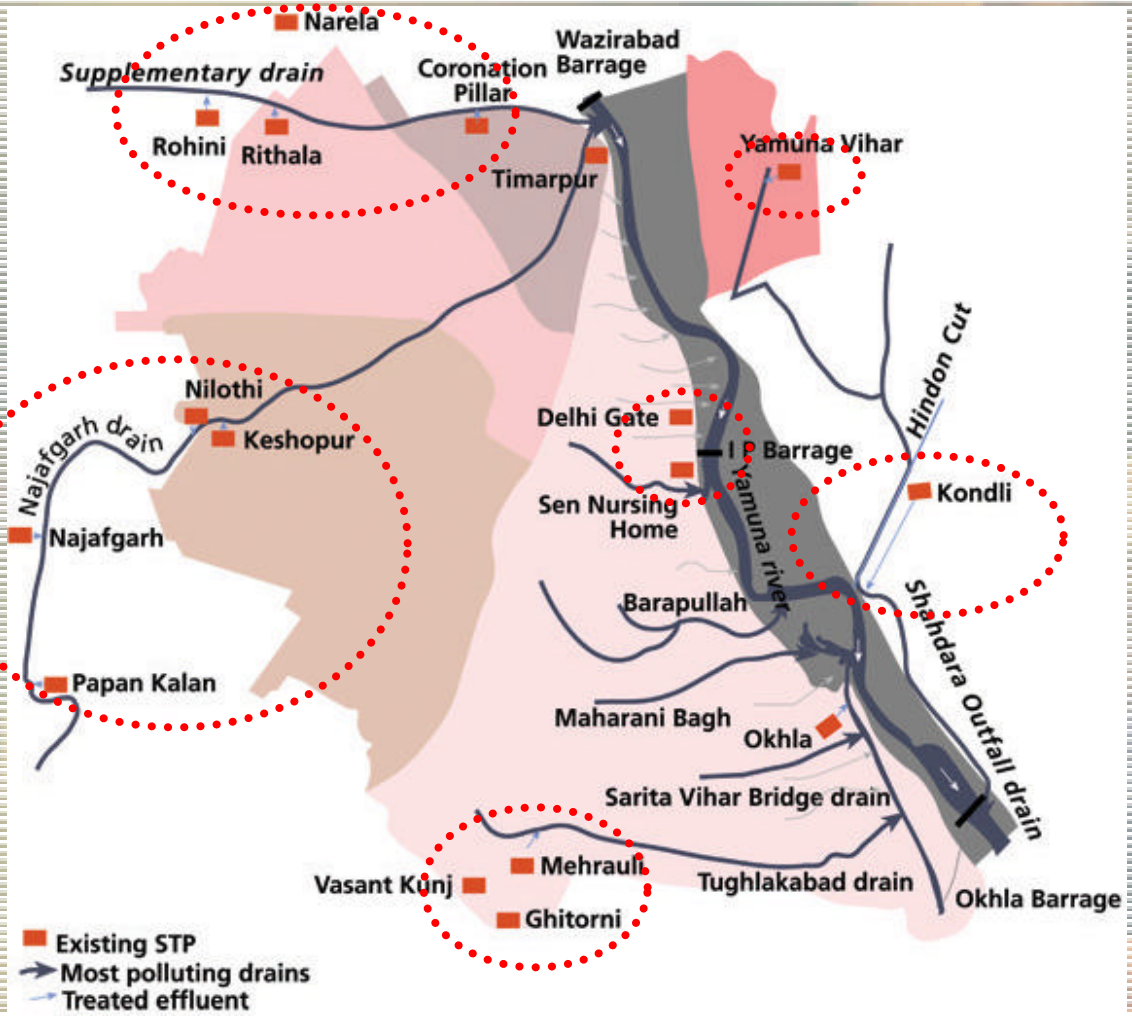
Or

- **Once sewage is treated; put into river for dilution – treat close to the river as possible**

- **Promote reuse so treat close to the source as possible. Build where there is waste. Where you build plan for disposal or reuse**

Sewage Canal: How to Clean the Yamuna

Intercept in drain; take to treatment plant; treat; reuse and not mix in same drain. If no option for reuse; treat and dispose directly in the river. Meet standards needed for assimilative capacity of river



Sewage Canal: How to Clean the Yamuna

Based on this principle plan for each drain: 6 drains contribute 90 per cent of flow

Drain	Percentage contribution towards wastewater flow during 2003-2004	Percentage contribution towards BOD load during 2003-2004
Najafgarh Drain + Supplementary Drain	48	29
Shahdara drain	16	20
Drain near Sarita Vihar Bridge	17	10
Maharani Bagh Drain	2	8
Barapulla Drain	5	7
Sen Nursing Home drain	2	7
Total from six drains	**90**	**81**
Rest of the drains	10	19

Sewage Canal: How to Clean the Yamuna

3. Plan sewage-sanitation for all

- **It is unacceptable that half of Delhi does not have access to sanitation or sewage**

Invest

- **But think differently. Find leapfrog solutions to new sewage answers**
- **Re-invent the flush toilet – so that it is affordable for all**
- **And does not cost us the Earth**

4. Rework water; rework economics

- River needs water to assimilate our waste
- Reduce water use to reduce waste discharge
- Recycle and reuse waste as water

Learn **economics** of water-sewage-excreta

Learn the economics that **matter**

Sewage Canal: How to Clean the Yamuna

Think great. Not **big**

- **Have to rework paradigm of water and waste**
- **Have to rethink waste – so that we generate less; can treat cheaply; can reuse**

- **No options**
- **Remember: We all live downstream**