

# Sustainable Technology Options for Reuse of Wastewater

R.C. Trivedi,  
Additional Director,  
Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar,  
Delhi – 110032  
Ph – 011 22302188  
Email – [adrct.cpcb@nic.in](mailto:adrct.cpcb@nic.in)

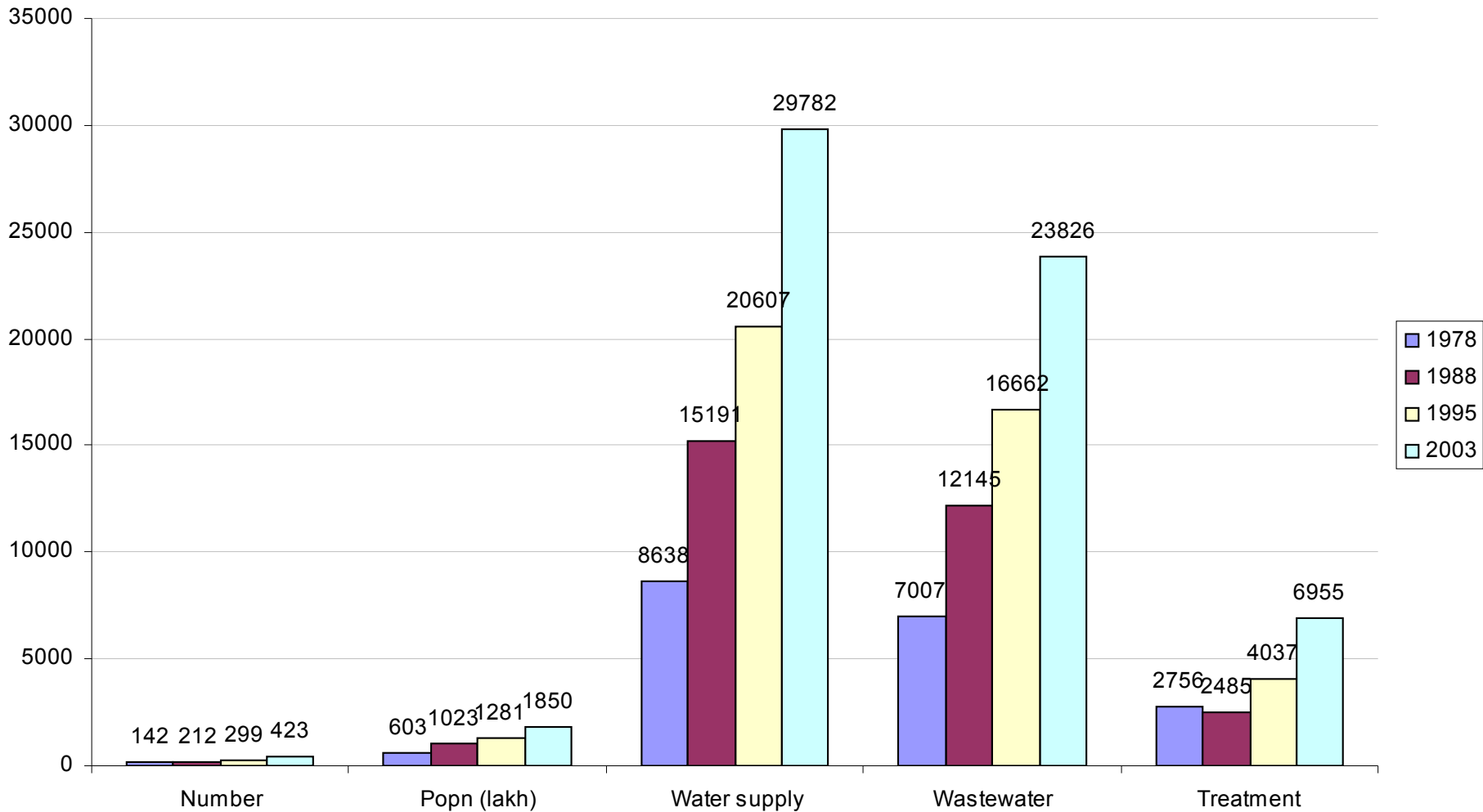
# Need for Reuse

- It is estimated that about 29000 mld of domestic and 15500 mld of industrial wastewater is generated in India and it is steeply increasing
- Treatment capacity exists for only about about 7000 mld domestic and 9000 mld industrial wastewater
- Large number of river stretches are polluted
- Discharge of untreated domestic wastewater is single major cause of water pollution in India

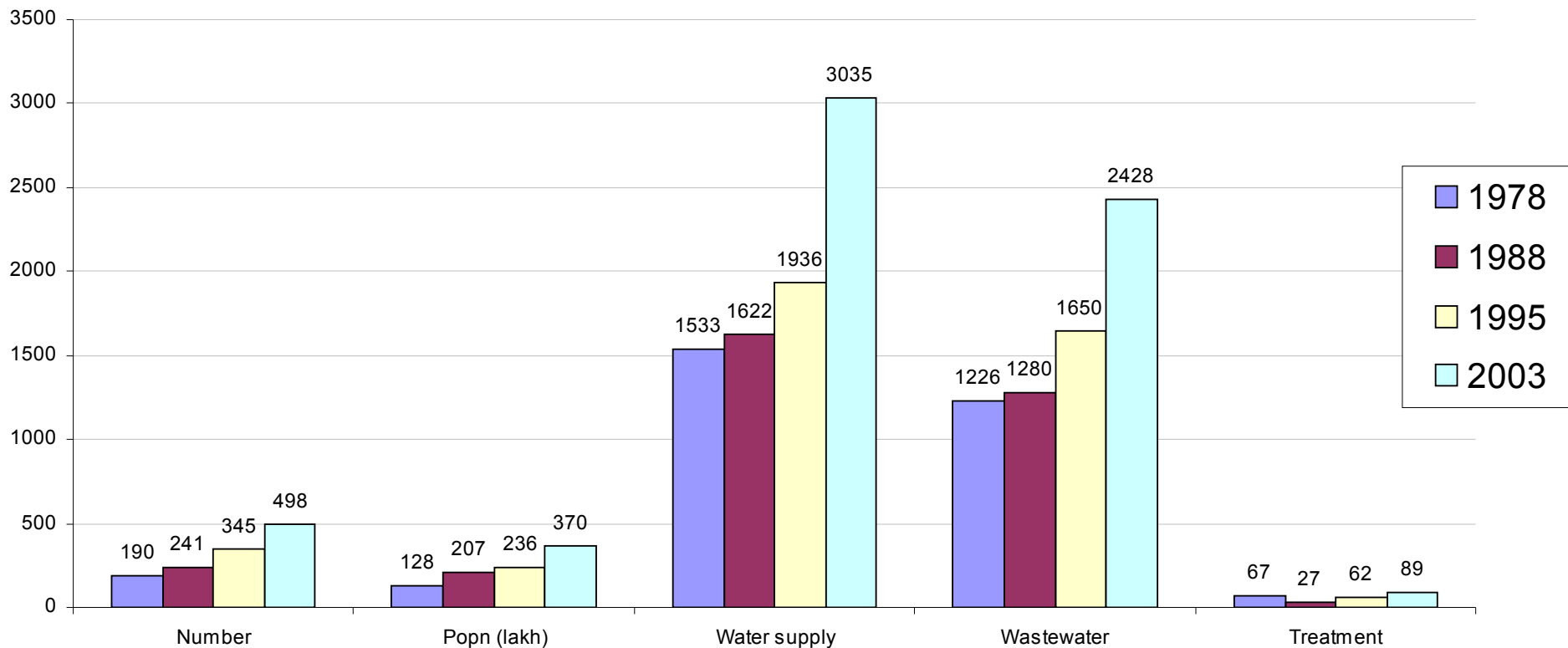
# Need for Reuse -contd

- Due to fast urbanisation, industrialisation and agricultural activities demand for water is increasing steeply
- Water resources are shrinking
- Continuing discharge of wastewater in water bodies even after treatment (to whatever stringent level beyond MINAS) may not help maintaining 'wholesomeness' of our aquatic resources
- Thus it becomes inevitable to discontinue discharge of wastewater into our dwindling water resources

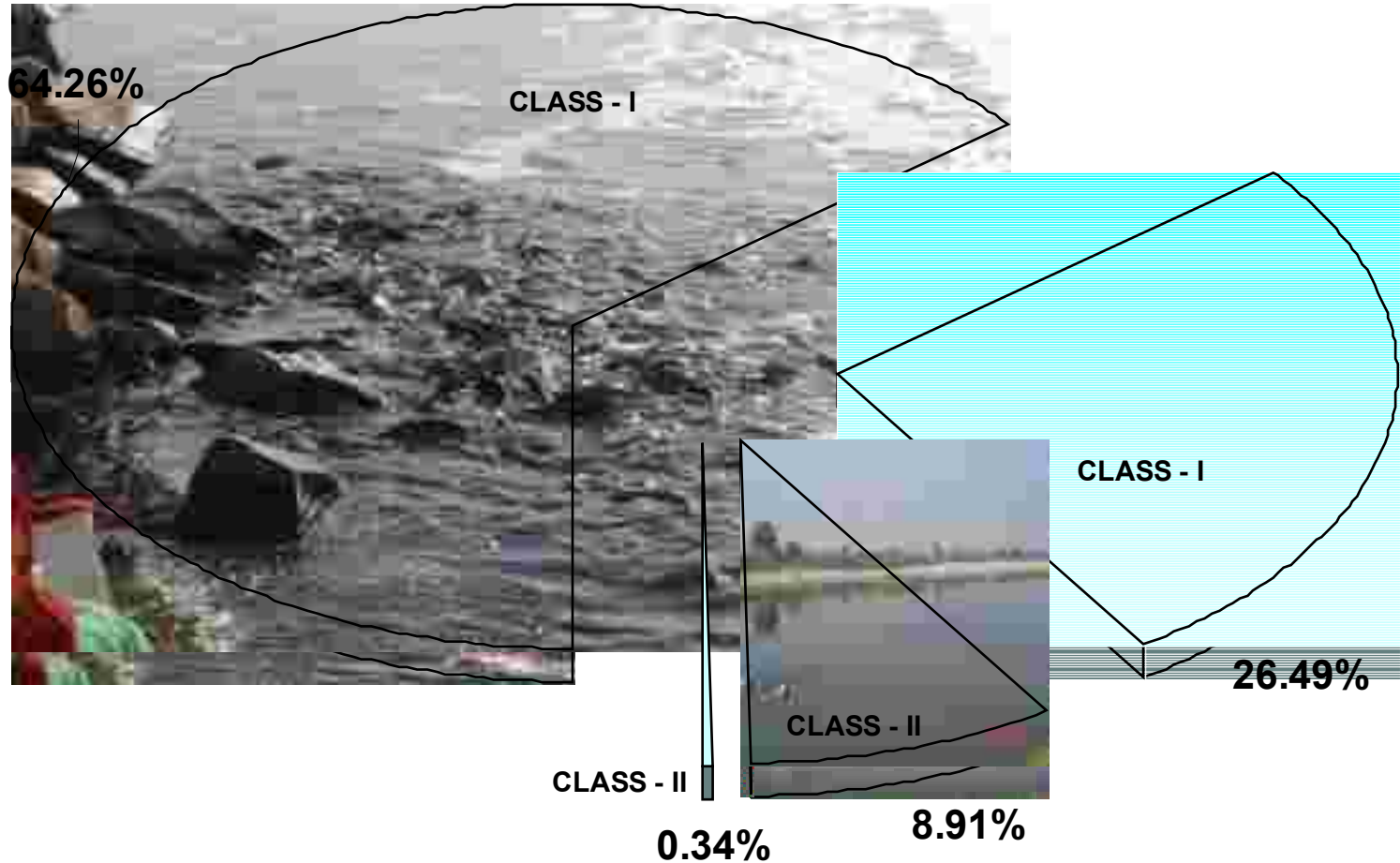
# Water supply and sewage disposal status in class I cities



# Water supply and wastewater generation and treatment in class II towns of India



# WASTEWATER GENERATION AND TREATMENT (mld) IN CLASS - I AND CLASS - II CITIES IN INDIA



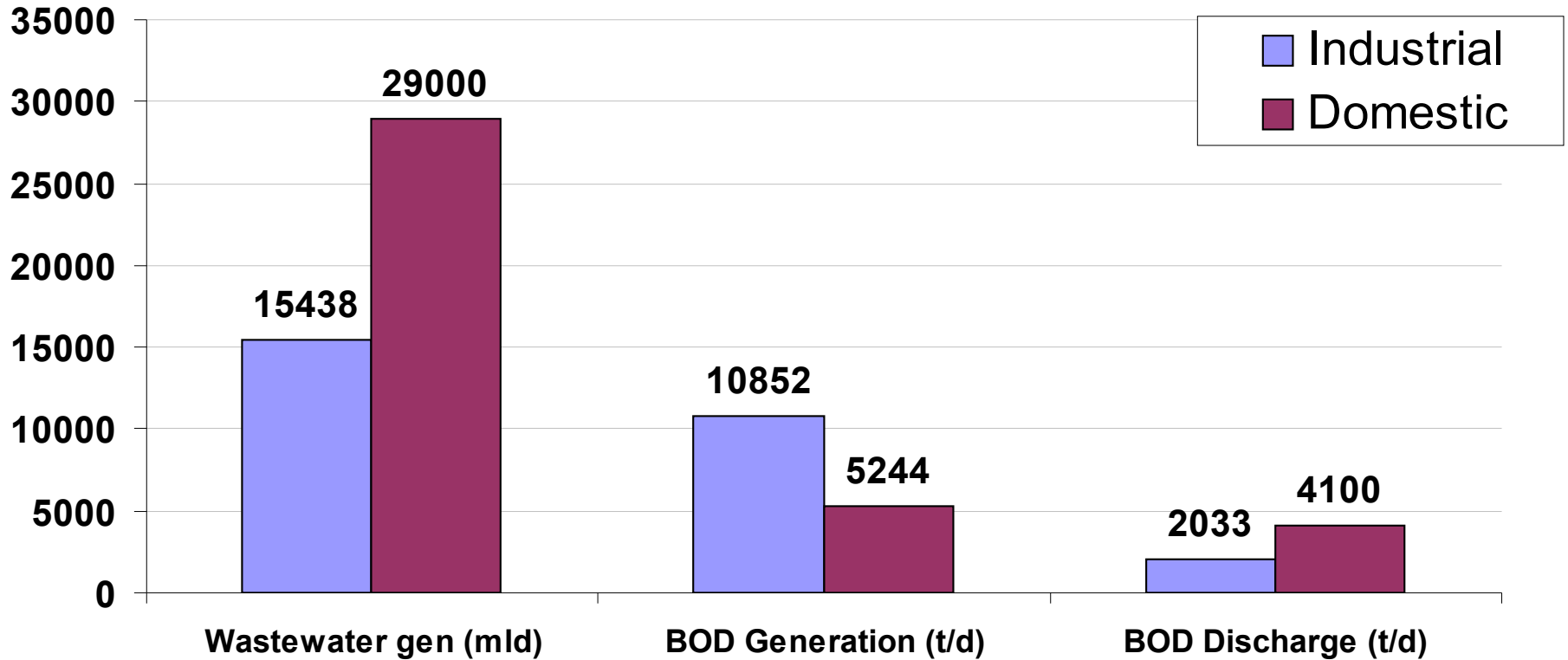
■ Generation (C-I) - 23826

■ Treatment (C-I) - 6955

■ Generation (C-II) - 2428

■ Treatment (C-II) - 89

# Comparison of pollution load generation from domestic and industrial sources



# Irrigation as an Effective Option for Reuse of Wastewater

- Irrigation is largest user of water (nearly 85% of water used)
- Nearly half of the sewage is used for irrigation, Delhi's sewage is used in Agra Canal's command area
- In Haryana, Punjab and many other states the wastewater is sold
- Nearly 2 lakh ha land can be irrigated with the sewage generated from Class-I cities and Class-II towns
- Problem in monsoon



# Sustainable Technology

- Irrigation
  - Soil is very rich in microbes (560 million microbe cell/g of fertile soil)
  - High diversity can take care of large number of pollutants
  - Aeration is very fast
  - Effective and efficient

# Benefits

- Safe, if crop is not consumed raw
- Value of nutrients and water
- Good soil conditioner – increases nutrients and water holding capacity and promotes microbial activities
- Pollution of water courses can be avoided

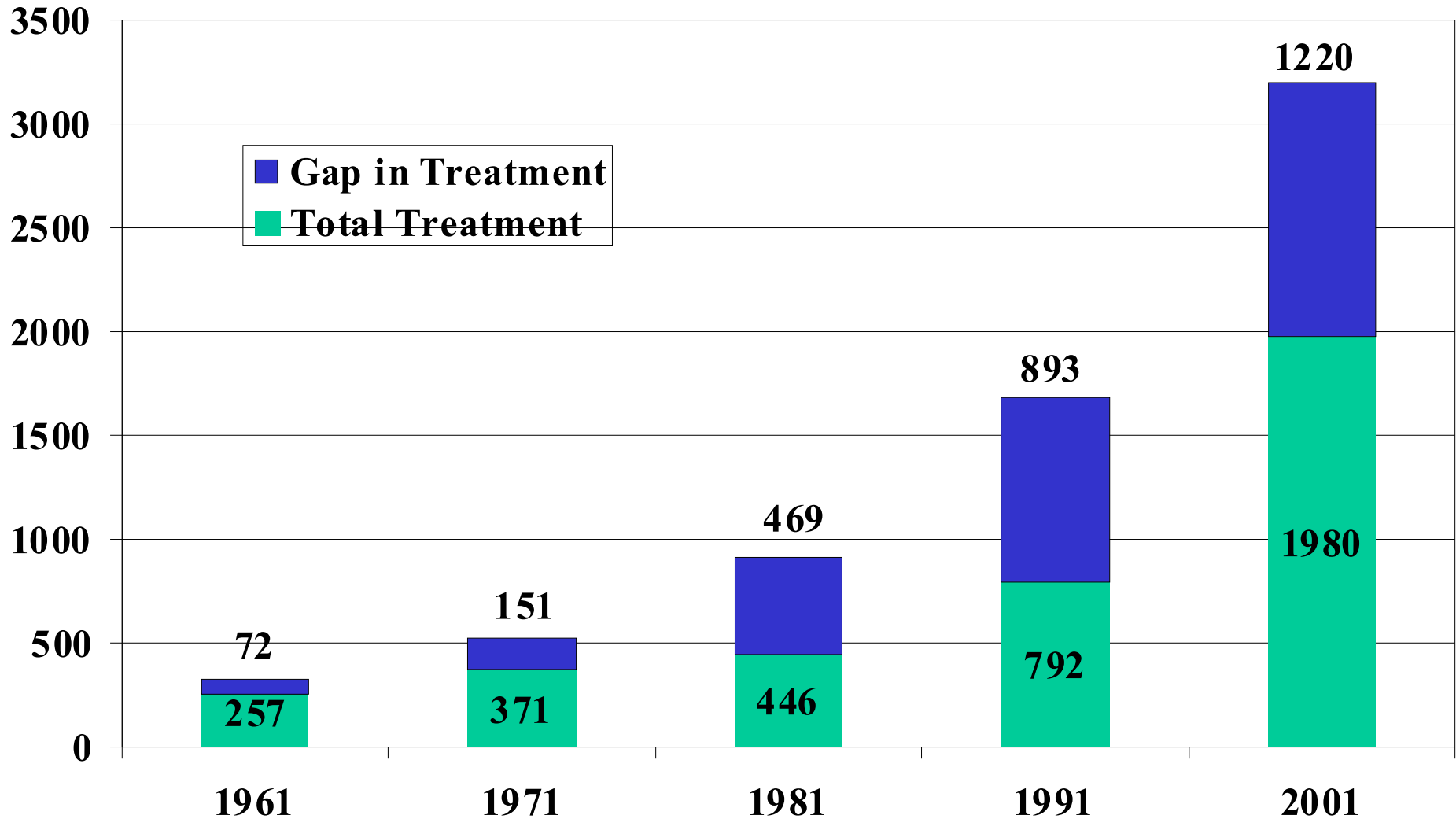
# Sustainable Technology

- Root-Zone Technology
- Karnal Technology
- Ferti-irrigation
- Constructed wetland – fisheries

# Economic Value of the Waste Water Generated from Class I Cities and Class II Towns.

Parameters	Quantity/year	Value in Rs.*	Total value, Billion Rs
<b>Total volume of sewage generated from Class-I cities and Class-II towns/year</b>	9583 billion litre	60/Million litre	0.575
<b>Nutrient contents, @ Nitrogen (48 mg/L), Phosphorus (11 mg/L), Potassium (21 mg/L)</b>	766.6 million ton	12000/ton	9199.4
<b>Organic matter @</b>	3833.1 million ton	200/ton	766.6
<b>Grand Total</b>	-	-	<b>9966.6</b>

# Decadal Growth of Sewage Generation and Treatment in Delhi (MLD)



# Waste Water Generation and Treatment Status in Delhi (2003)

