# WATER QUALITY MANAGEMENT FOR THE CITARUM RIVER BASIN

**(Implemented by Jasa Tirta II Public Corporation)**

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# INTRODUCTION

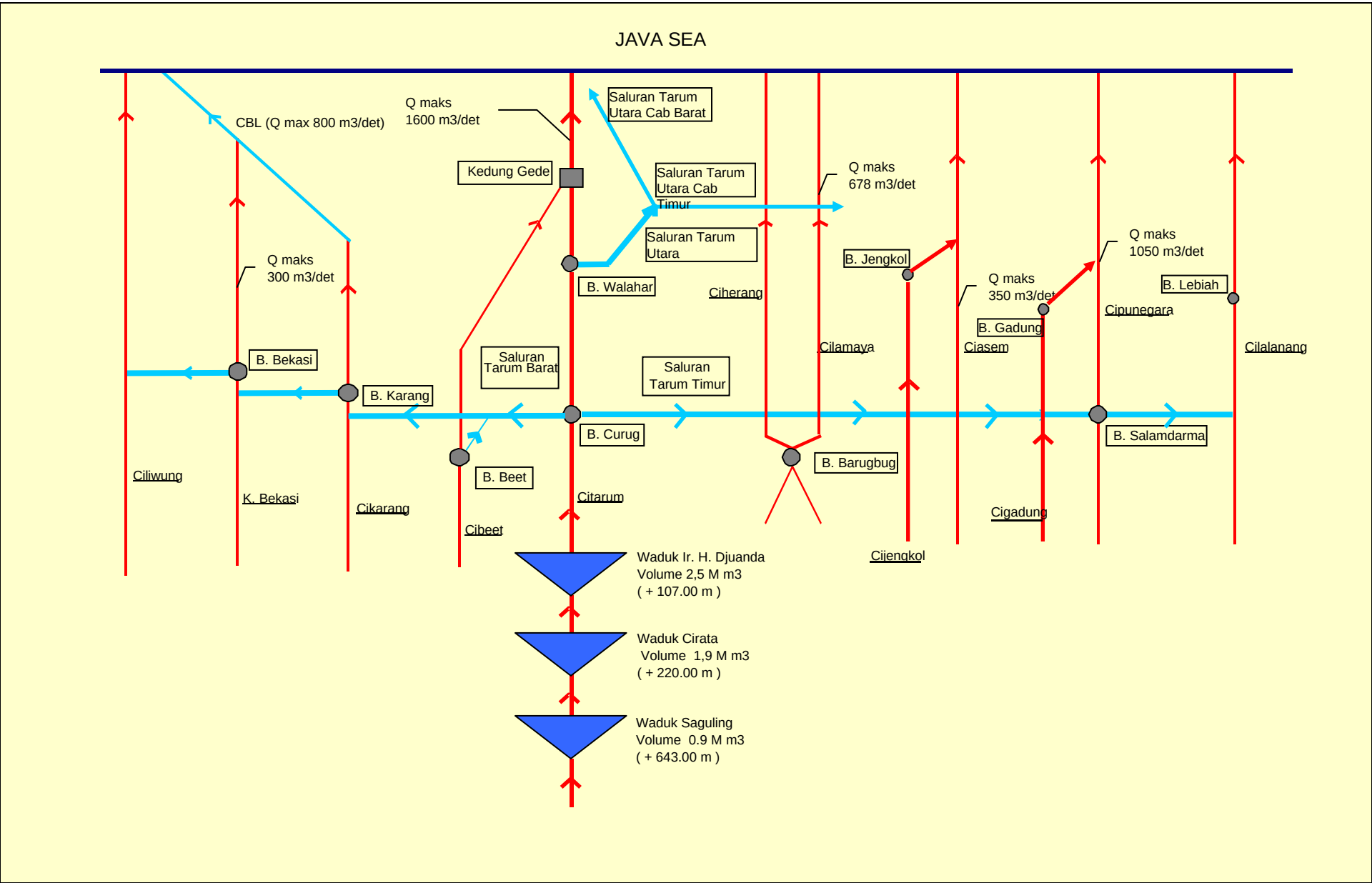
## Physical Feature of The Citarum River Basin

- Located in West Java Province
- Service Area : West Java & DKI Jakarta
- Annual precipitation depth :
  - 3,000 mm/year in the mountain
  - 2,500 mm/year in lowland
- Relative humidity : 80 %
- Daily temperature :
  - 25 $^{o}$C in the lowland
  - 18 $^{o}$C in the mountain
- Measure over : 11,000 km$^{2}$
- Length : 270 km
- Three large, multi purpose dams :
  1. Saguling
  2. Cirata
  3. Ir. H. Juanda

- Rainfall in the basin :
  - 4,000 mm/year in the mountainous areas in the upper catchments
  - 1500 mm/year along the coast
- Annual discharge 5,700 million m3 and ivertible run off from the unregulated river amounts to 1,800 million $m^3$ annually

- A relatively small amount of water is transferred into upper Citarum Basin from the neighbouring Cilaki and Cibeet basins located to the south.
- There are 9 rivers traversing the area from the south to north and terminated in Java Sea.
- Citarum River in the biggest one connected with 4 rivers to the west and 4 rivers to the east by manmade canals namely West Tarum canal (WTC) and East Tarum Canal (ETC) formed a unit of hydrological boundary of Citarum intergrated basin of 12,000 $km^2$.

# SCHEME OF JATILUHUR WATER RESOURCES SYSTEM



# JURISDICTION AREA OF JASA TIRTA II PUBLIC CORPORATION

# WATER QUALITY ISSUES

## Water Quality Issues

- Change of water demand in Citarum River Basin parallel with economy expanding of Indonesia.
- Manufacturing activities and expanding population produce pollution which is discharged from point or diffuse sources into the Citarum rivers.
- All these wastewater effluents will continue to increase unless preventive measure are taken.
- Indonesia has taken a number of measures to control water pollution in the area. The main measures have been create legal effluent and river water standards, come to an understanding with industry about pollution control and PROKASIH

- The very large economic development in the catchments area of the Cikao, Cibeet, Cikarang and Bekasi relative to the discharges in these rivers means that there is either unacceptable pollution now or that there will be increasing amounts for the future development.
- The pollution load is expected to almost double by year 2025.

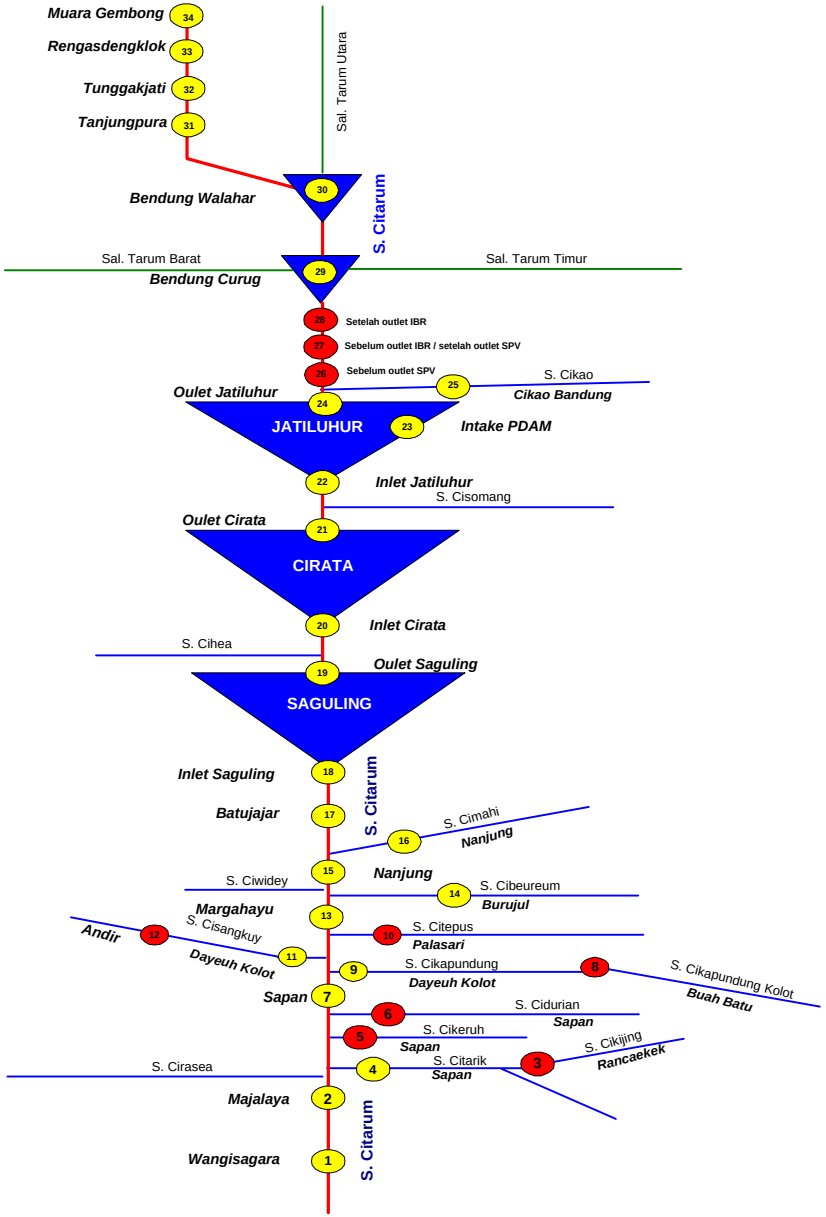
- **Its important to develop a management program which encourages reduction in their production, and at the same time provides treatment system for those, largely domestic.**

- A large user of Citarum river is Electricity State Company (PT. PLN) for hydropower generation from upper two hydropower reservoir (Saguling and Cirata) and PJT II also generates electricity from lower reservoir (Ir.H.Juanda dam). The chemical pollution effect of this use is not great.
- After the irrigation water abstraction, the city of Jakarta is by bar the greatest abstracter of Citarum river water.

- **In term of organic material the planned by passing of the polluted rivers of the Cibeet, Cikarang and Bekasi from the West Tarum Canal will relieve an organic pollution load from the drinking water supply to Jakarta by about 11% of the present total. This is presently a relative small portion.24**

- **The most important single source of pollution to the Citarum river in the Bandung district as a whole, but especially the municipal area.**
- **Discharge from Bandung area have been responsible for the extreme eutrophic deterioration has negative impacts for:**
  - **hydropower stations --- corrosion**
  - **productive uses of the lakes for fishing and recreation**

- **Ir.H.Juanda reservoir at present isn't greatly affected in this way but in the course if time its deterioration will be more evident if no further action is taken.**




# WATER QUALITY MONITORING LOCATION IN CITARUM RIVER BASIN

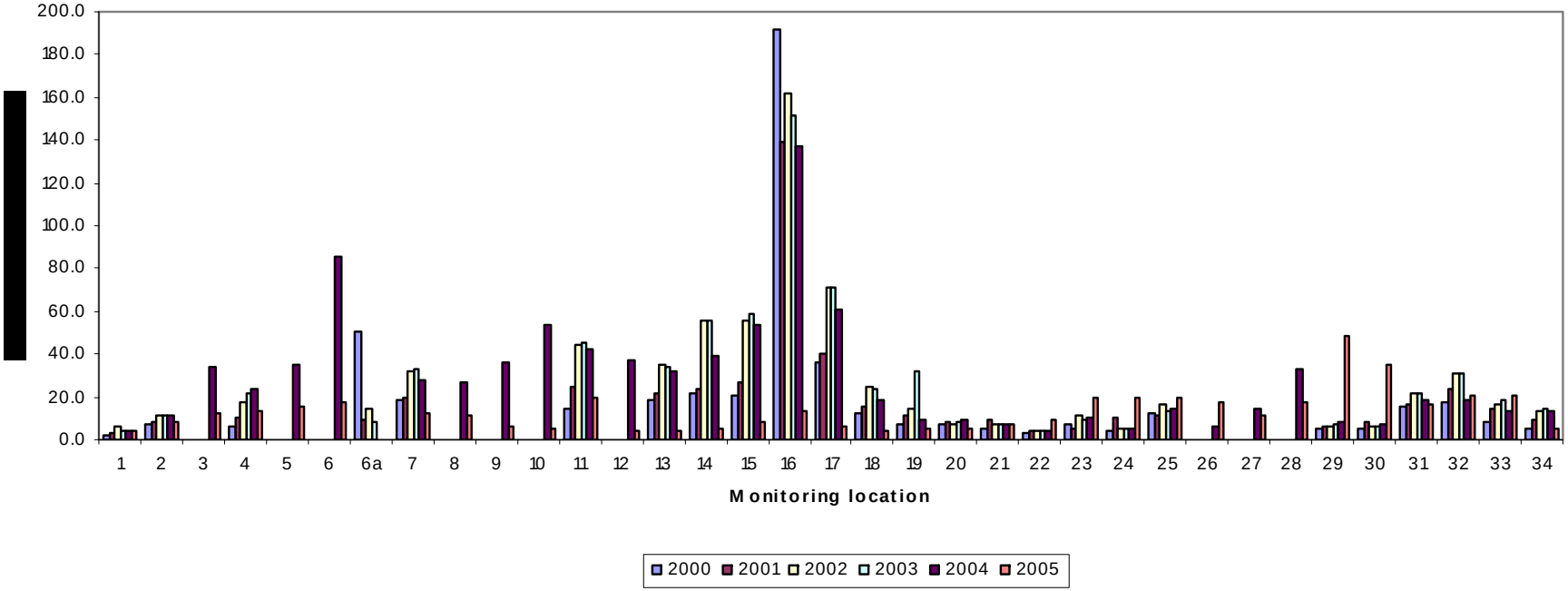
## MONITORING LOCATION :

1. Wangisagara
2. Majalaya
3. Rancaekek
4. Citarik Sapan
5. Cikeruh Sapan
6. Cidurian Sapan

6a. Ciganitri

7. Sapan
8. Buah Batu
9. Cikapundung Dayeuh Kolot
10. Palasari
11. Cisangkuy Dayeuh Kolot
12. Andir
13. Margahayu
14. Cibeureum Burujul
15. Nanjung
16. Cimahi Nanjung
17. Batujajar
18. Inlet Saguling
19. Outlet Saguling
20. Inlet Cirata
21. Outlet Cirata
22. Inlet Jatiluhur
23. Intake PDAM
24. Outlet Jatiluhur
25. Cikao Bandung
26. Sebelum Outlet SPV
27. Sebelum Outlet IBR / Sesudah Outlet SPV
28. Sesudah Outlet IBR
29. Bendung Curug
30. Bendung Walahar
31. Tanjungpura
32. Tunggakjati
33. Rengasdengklok
34. Muara Gembong

**AVERAGE BOD CONCENTRATION (mg/L)**
**CITARUM RIVER**
**YEAR 2000 - 2005**



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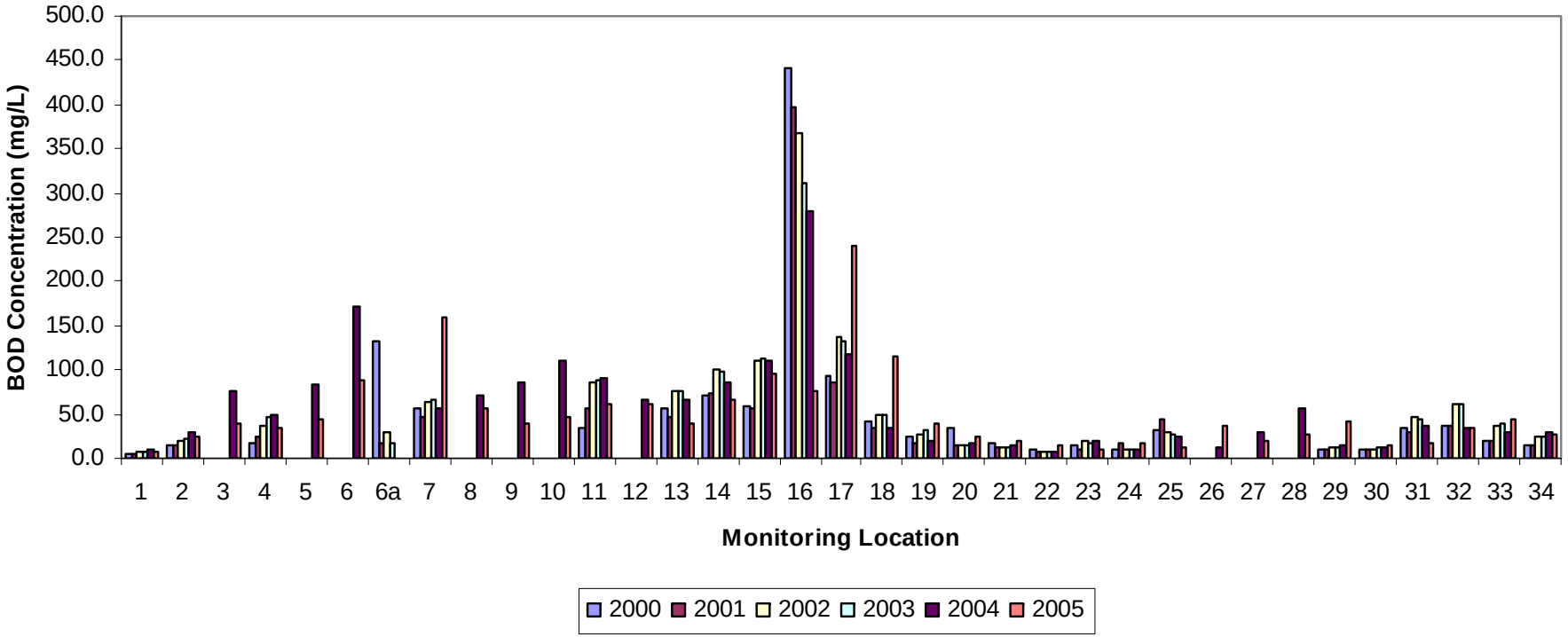


# RESERVOIR AND CATCHMENT AREA EROSIONS

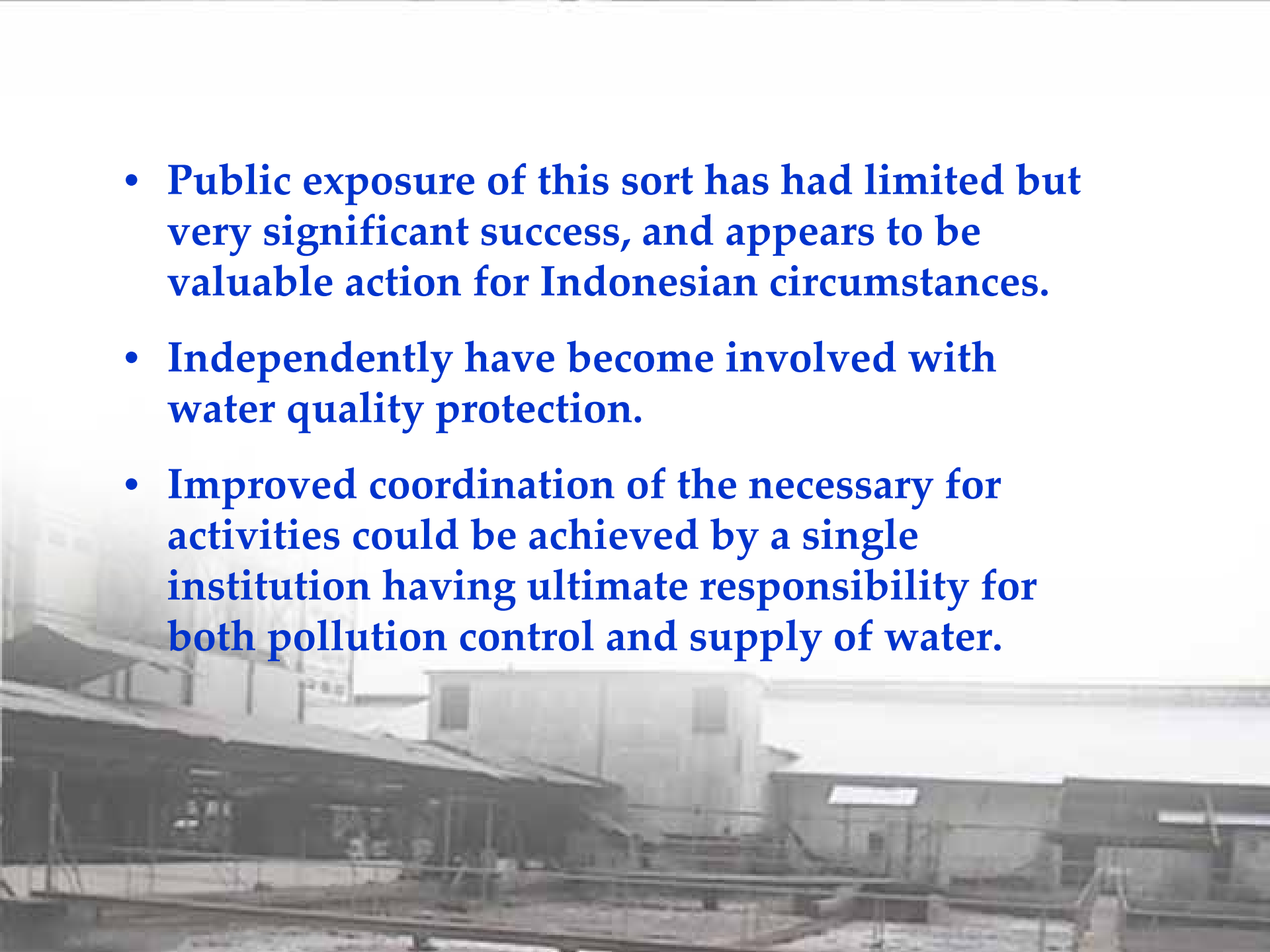
- These reservoirs are very important in interpreting the environmental impacts of pollution and of monitored water quality data.
- Land clearing and deforestation of upper catchments area increased soil erosion and the silt loads in the rivers.
- Soil conservation is important in the area for maintaining good water quality.
- It is recommended that more attention should be given to reforestation and higher input farming project.

# WATER QUALITY MANAGEMENT

## Control Program

- **PROKASIH has been initiated by Environmental Impact Control Agency/BAPEDAL (under Ministry of Environment) and the technical aspect of this program have been designed and organized by Centre of Water Environmental Unit (Balai Lingkungan Keairan) of Research Institute for Water Resources Development (Puslitbang Pengairan) under the Ministry of Public Works. Now, this program coordinated by Environmental Bureau (Biro Lingkungan Hidup).**
- **Major factories are required to have their effluents sampled and analyzed, and the water characteristic in receiving water are also measured.**
- **Polluters contravening regulations are identified and publicly advertised to try to encourage compliance with regulations.**

- Public exposure of this sort has had limited but very significant success, and appears to be valuable action for Indonesian circumstances.
- Independently have become involved with water quality protection.
- Improved coordination of the necessary for activities could be achieved by a single institution having ultimate responsibility for both pollution control and supply of water.



## Management Policy

- A water quality management program must be supported within a legal policy and action strategy
- ‘Polluter pays’ principle works effectively for large factories but it does deal satisfactory with the very large number of small polluters.

## Institutional Responsibility

- Water quality management is not likely to be effective if separated into independent administrative areas of operation.
- Jasa Tirta II is appropriate to this capacity because it already has established departments and section which can form a suitability structured institution to cover water quality management of Citarum river, and because it was originally set up for such purposes.

- Increased responsibility of Provincial Government in the Management or water quality trough the Water Resources Unit will increase the importance of Basin Water Resources Management Advisory Committee (PPTPA).
- Inspection of factories and of any other pollution : Provincial Government task and carried out by the new District Level of Environmental Impact Control Agency (BAPEDAL).
- Environmental and anti pollution laws for water quality management are already existed. But power of enforcement of regulation are presently weak.
- Monitoring industrial processes, effluents and receiving water should be operated as an integrated system, and a single organization should report on all of these aspect.

## Institutional Strengthening

- To carry through a water quality program, it necessary to strengthen the institutions concerned.
- Specific urgent topics have been identified which need immediate attention.

## Public Awareness

- Improvement of domestic pollution should be approached through a public awareness campaign and community development.

# CONCLUSION

**An effective water quality control program in the Citarum basin requires a comprehensive strategy and set of objectives which integrate the different activities in the catchments. This in turn requires institutional adjustments, training and legal improvement.**

**The government of Indonesia has already taken a number of good initiatives, including : regulation, standards, a monitoring program and organizing which have responsibility for water quality. But management of water quality in the Citarum basin remains limited and the waters are becoming increasingly polluted.**

# THANK YOU