



CLIMATE CHANGE IMPACTS TO THE WATER ENVIRONMENT

Case Studies: Ciliwung Watershed



BACKGROUND INFORMATION

- **Indonesia consist of 6 main island, i.e: Sumatera, Jawa, Bali and Nusa Tenggara, Kalimantan, Sulawesi, Maluku and Papua;**
- **Population:**
 - **More than 200 million → population density 121 per km²**
 - **About 60% living in Jawa island → population density 1.035 per km²**
- **At least has 639 watersheds with 7219 rivers**
- **Average Precipitation 2000 – 3000 mm/year**



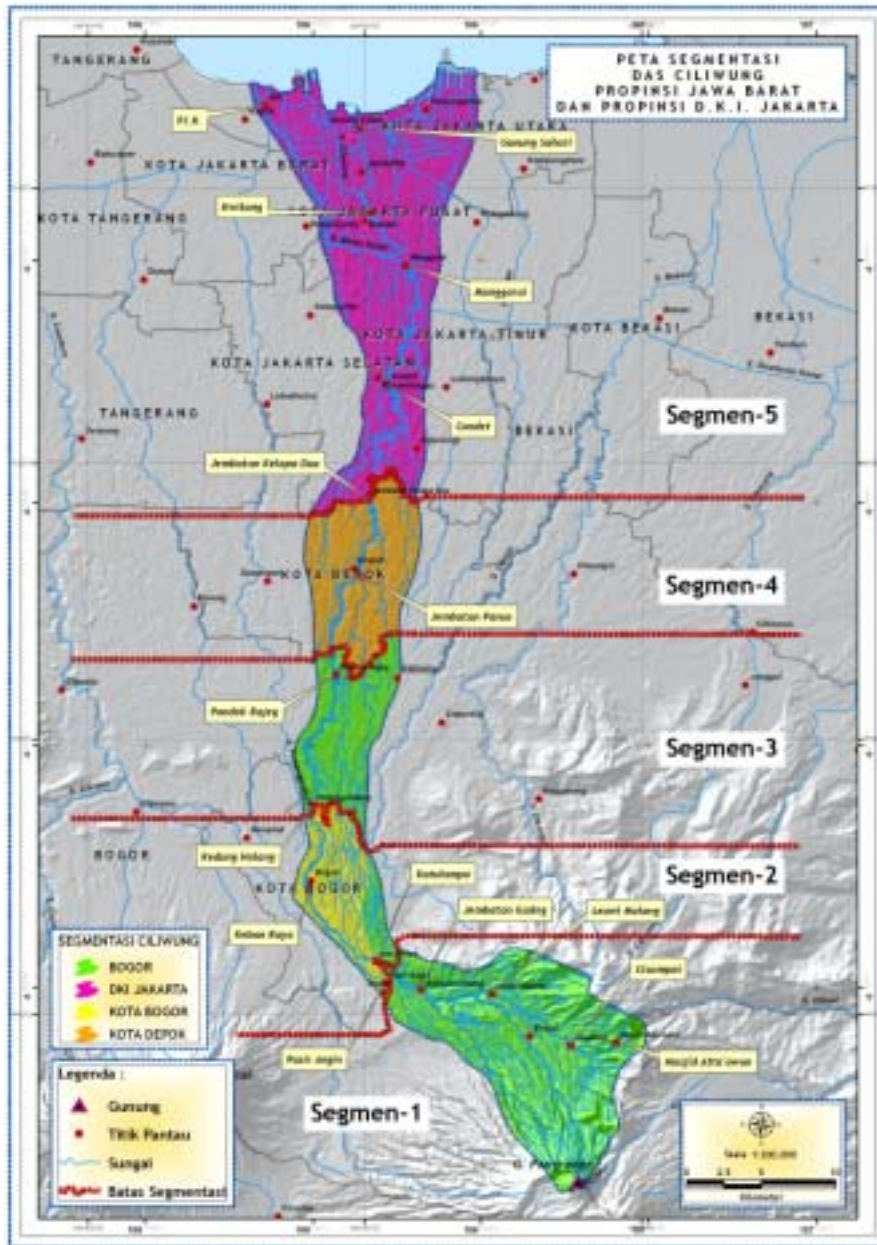
INDONESIA ARCHIPELAGO



JAWA ISLAND



CILIWUNG WATERSHED



Total Area:
52,494.5 Ha

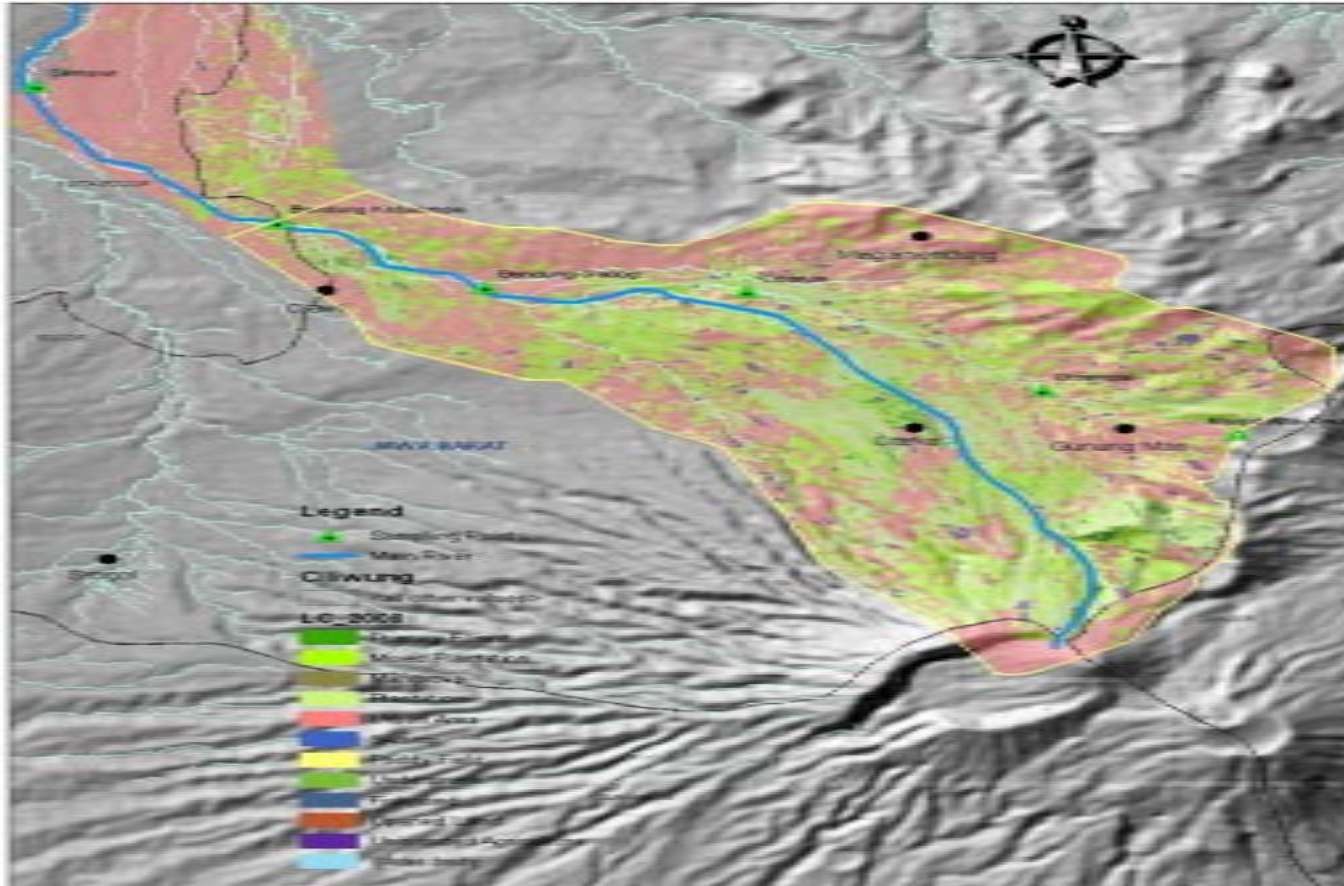
Landuse (%):

- Water Body: 0.2
- Forest: 14,0
- Open Land: 6,8
- Housing: 50,7
- Agriculture: 27,2
- Others: 1,2

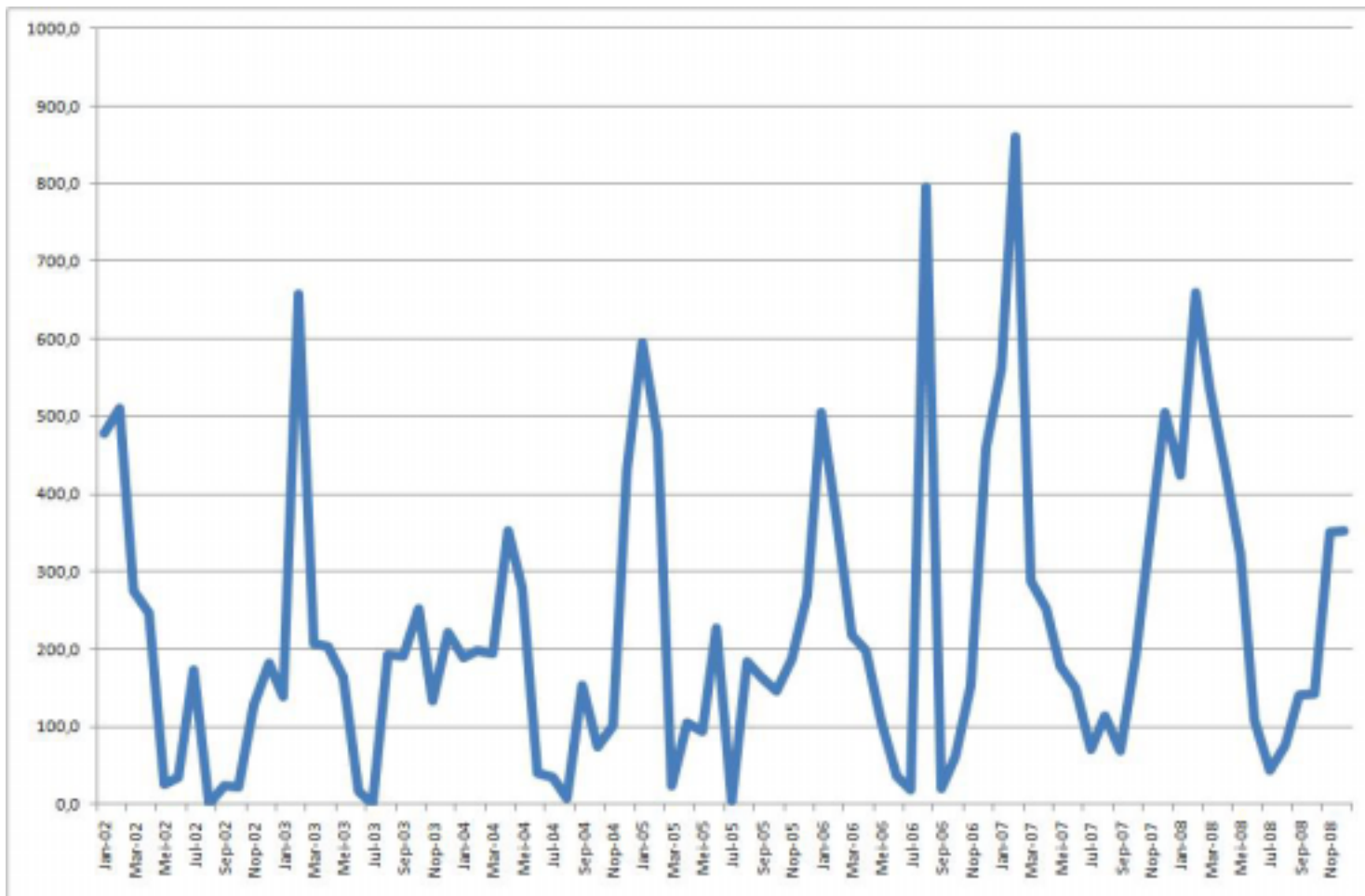
Population (2000):
11.7 million



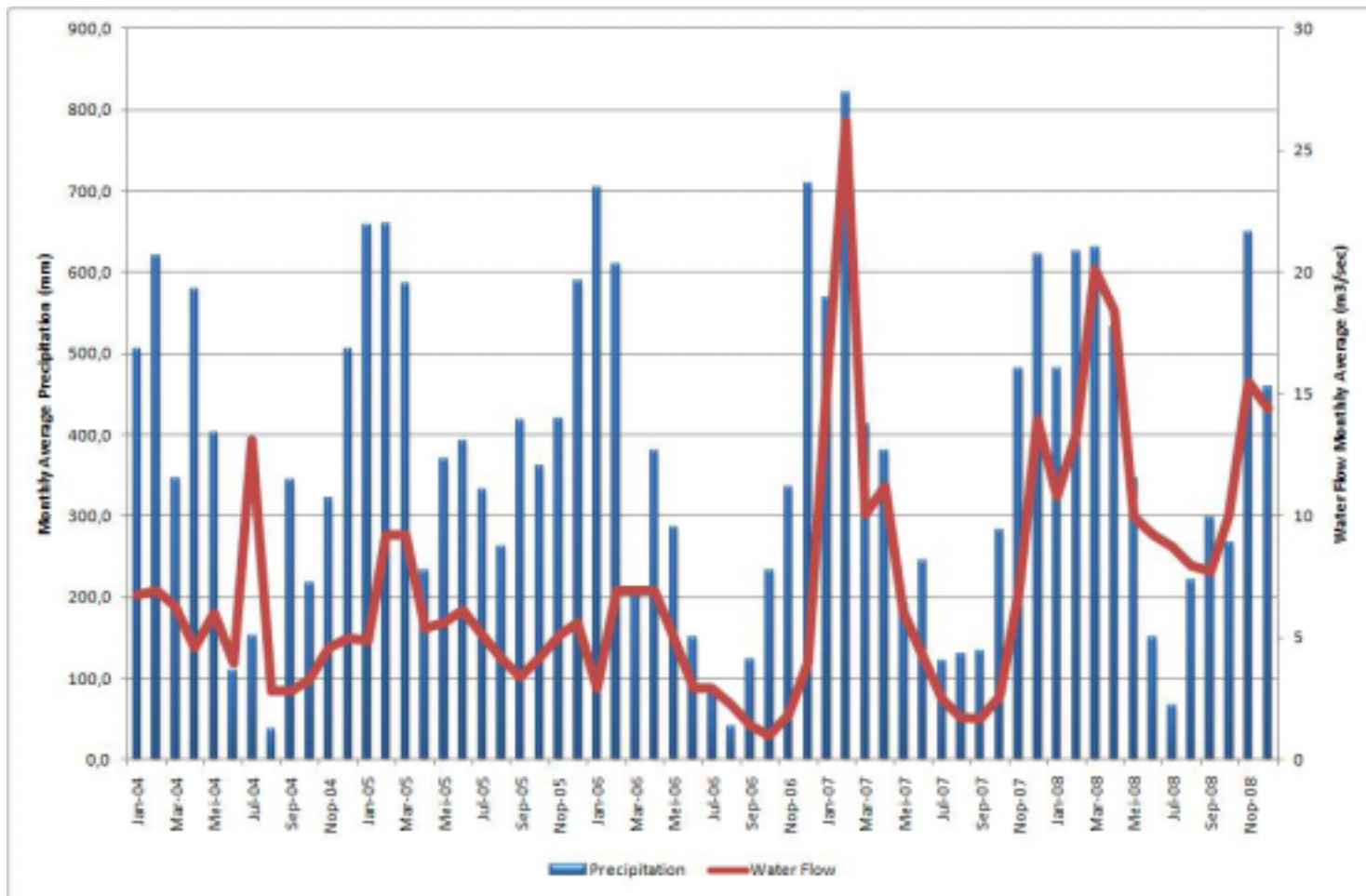
AREA OF STUDY



PRECIPITATION AT CITEKO STATION



PRECIPITATION AND WATER FLOW



WATER QUALITY (BOD CONCENTRATION)



FACTS

- Increasing of precipitation over 5 years
- Landuse change in upstream area of Ciliwung watershed:

Landuse	2002	2008
Forest	31.7%	18.4%
Open Land	20.5%	0.9%
Housing	4.2%	7.1%
Agriculture	43.6%	73.6%
Total	100%	100%



FACTS



ADAPTATION

- **Presidential Regulation concerning Ciliwung River Management → cross government institution program**
- **Completed Jakarta flood canal**
- **Water conservation with simple technology → Biopore Hole**
- **Utilization of biogas and fertilizer from livestock and municipal waste**



BIOPORE



BIOGAS

Biogas (Cow) in Cisarua - Bogor - West Java



CONCLUSION

- **The increasing of water flow is more affected by land use change rather than precipitation**
- **The impact of climate change on water environment can be minimized by water conservation and pollution control**
- **Communities should be involved in water conservation and water pollution control by using a simple and practical technology**



Thank You

