

Concept of appropriate water supply in the karst region Gunung Kidul, Southern Java, Indonesia

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Introduction

- karst region
- tropical climate
- ➔ water shortages during dry season
- no water treatment, no regular water quality monitoring
- dilapidated water distribution system
- water highly contaminated with fecal bacteria
- ➔ consumers boil water to avoid illness ➔ barely sustainable



map: <http://www.iwrm-indonesien.de/>

Aims

- development and implementation of a water quality monitoring system
- serves as a base for development of appropriate and sustainable **water supply concept**



Sampling at a reservoir

Analytical methods

- physiochemical analysis
 - temperature, pH, O₂, conductivity, turbidity
- microbiological analysis
 - ColiLert-System (quantitative detection of total coliform bacteria and *E.coli*)
- molecular biological analysis
 - PCR and population analysis



ColiLert- Analysis

Results and Discussion

- fecal bacteria (coliforms) in each sampling site
- dry season: increase of bacterial count within distribution system (see figure 1)
 - ➔ results from dilapidated and heated pipelines
- wet season: coliform contamination much higher
 - ➔ results from high input of bacteria and poor filtration capacity of karst underground

thorough water treatment is essential to prevent illness

sustainable and appropriate water treatment concept:

1. central filtration - turbidity removal before distribution system
2. hygienisation after the distribution system - central but close to the customer
3. household disinfection (e.g. ceramic filtration)

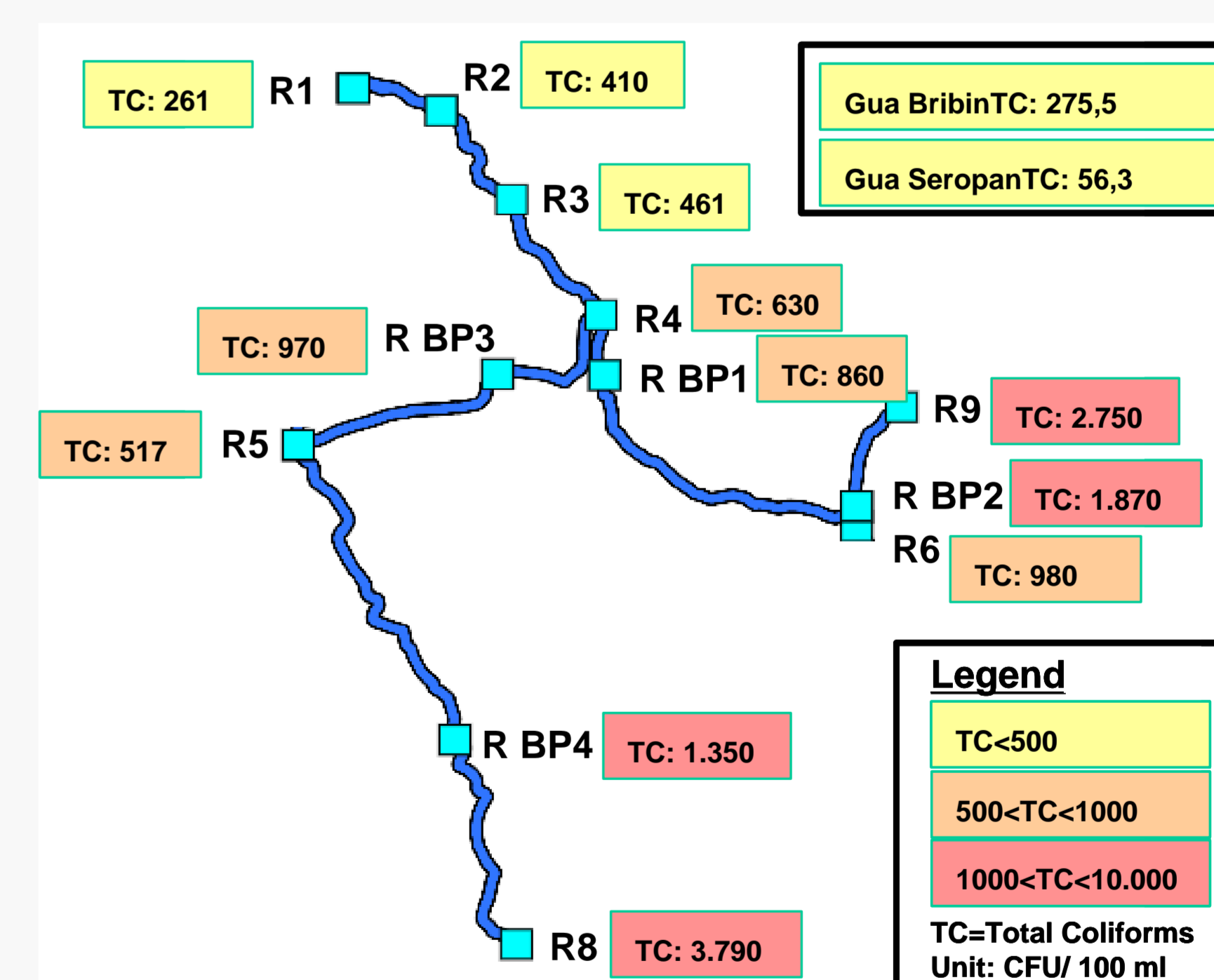
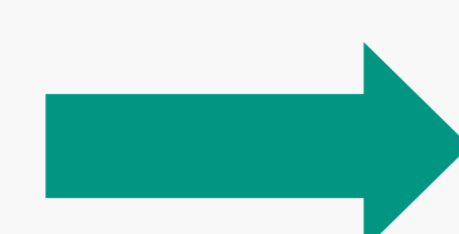


Figure 1: Distribution of total coliform data in July 2010
R1-R9 = reservoirs, R BP1-4 = pump stations

Conclusion and Outlook

water highly contaminated with fecal bacteria during dry and wet season



- **pipelines** have to be renovated
- **monitoring** has to be established
- appropriate **water treatment** has to be implemented



Dilapidated pipeline

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