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WASTEWATER USE FOR IRRIGATION IN JATILUHUR INTEGRATED IRRIGATION SYSTEM



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Presentation outlines

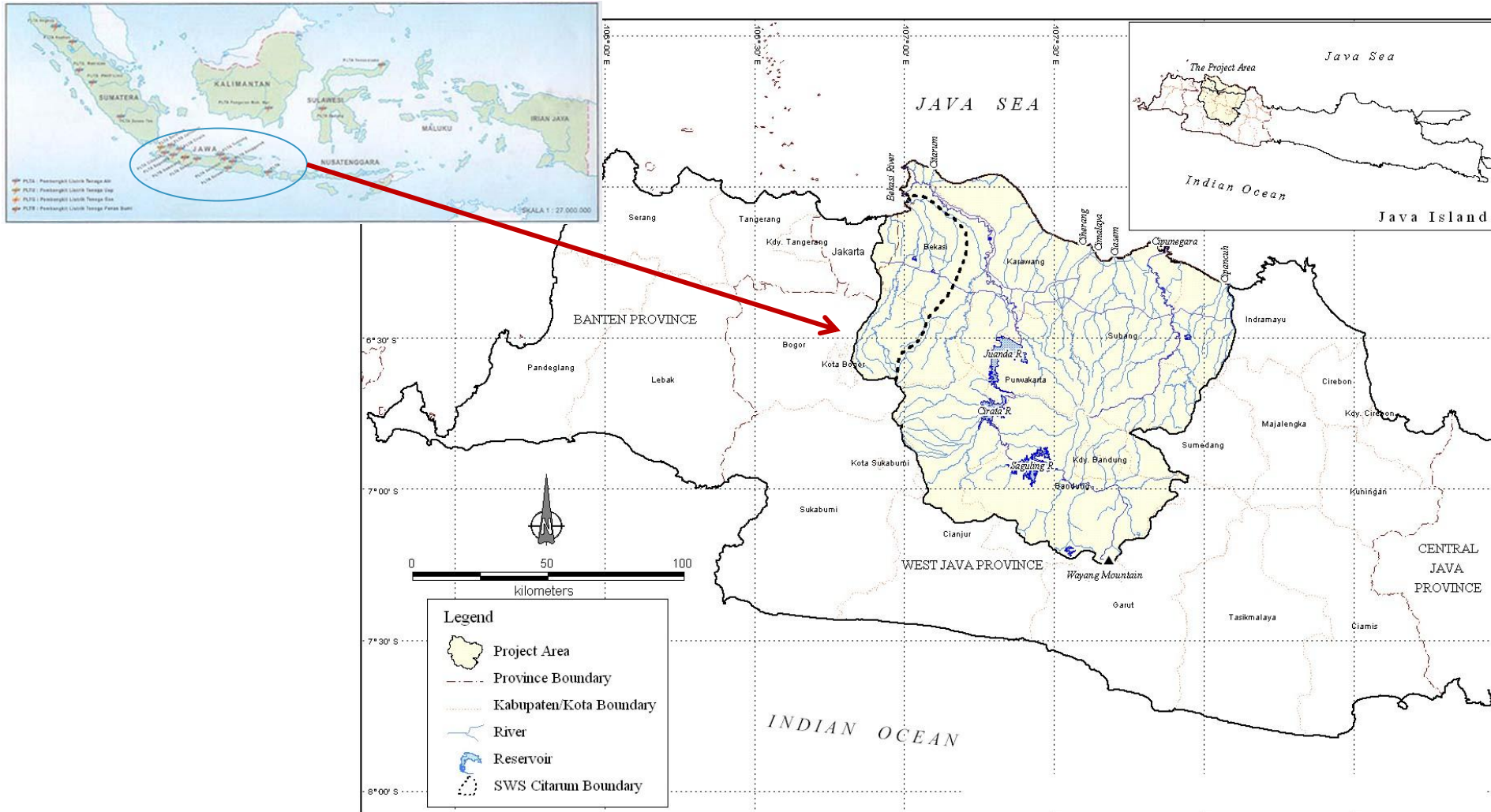
- 1. Description**
- 2. Development of provision**
- 3. Optimizing in integrated way**
- 4. Conclusion**



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Location of Citarum River Basin





1. Description

Jatiluhur Integrated Irrigation System (JIIS)

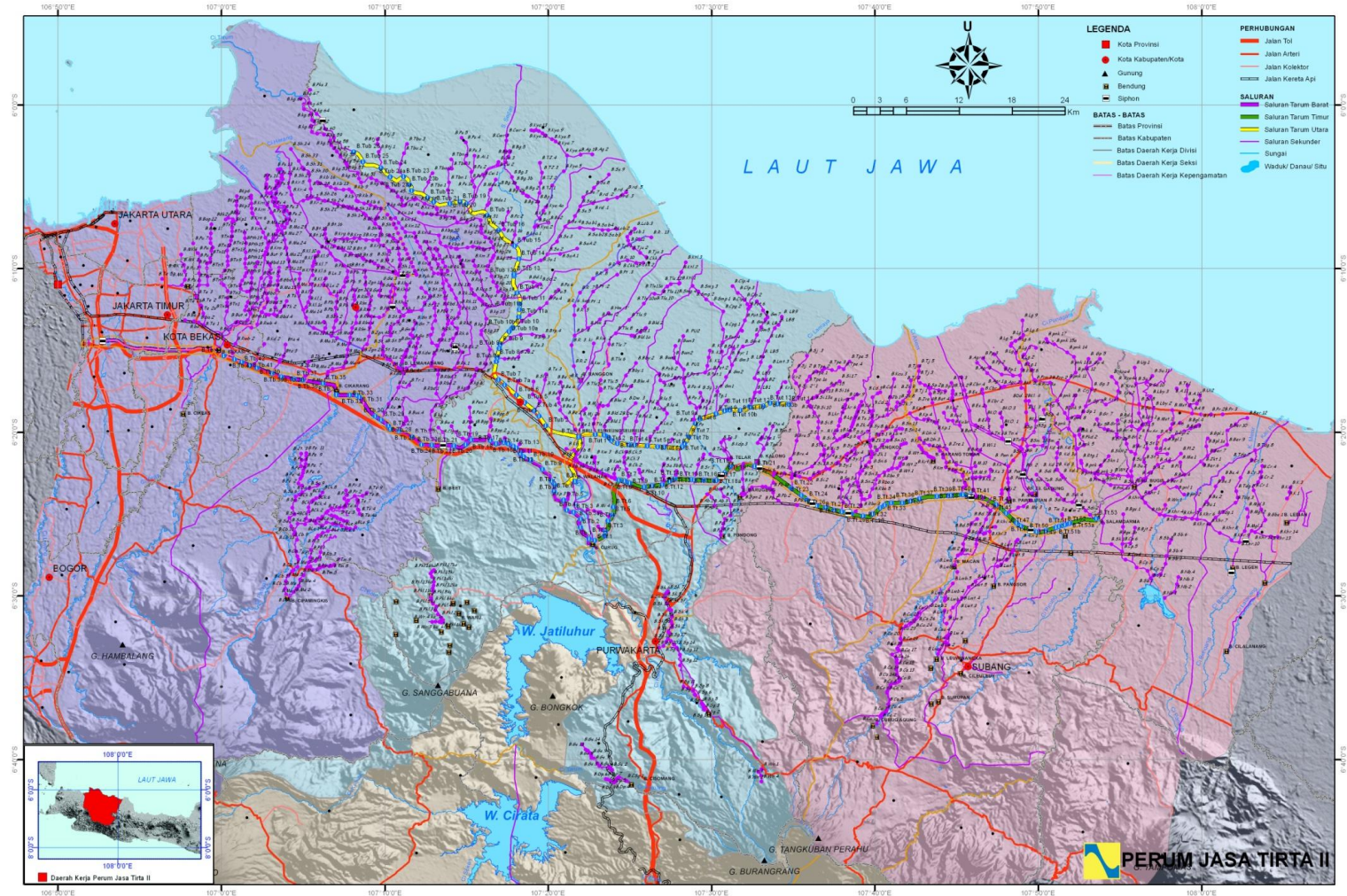
- Covers 12,000 km² of river basin; from Cilalanang up to Ciliwung River
- Stretched between two provinces (West Java Province and DKI Jakarta Province), operated in 1967
- Saguling, Cirata and Ir. H. Djuanda Reservoirs (Citarum cascade reservoir)
- Combination of existing irrigation systems built under Dutch colonialism (Salamdarma system in 1923 and Walahar system in 1925)
- Combined with potential local sources along the system (West, East and North Tarum Canal) for irrigation, domestic, municipal and industries
- The largest technical irrigation system in Indonesia (240,000 ha of paddy fields)
- Supporting the national rice production since 1980s



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Map of JIIS





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Irrigation Network Scheme

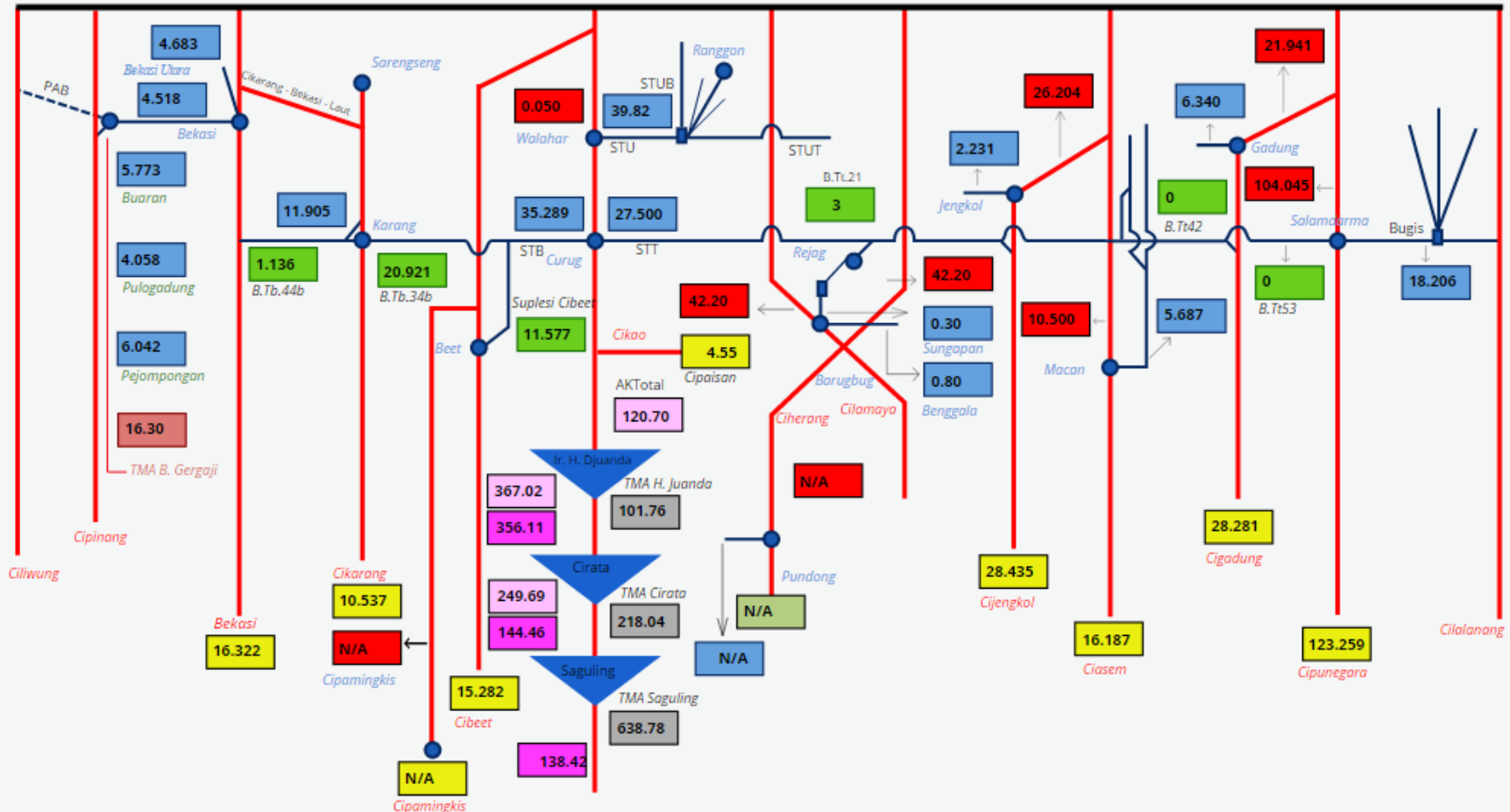
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Cari

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2. Development of Provision

Growing Human Activities → land use changes and outskirts developments

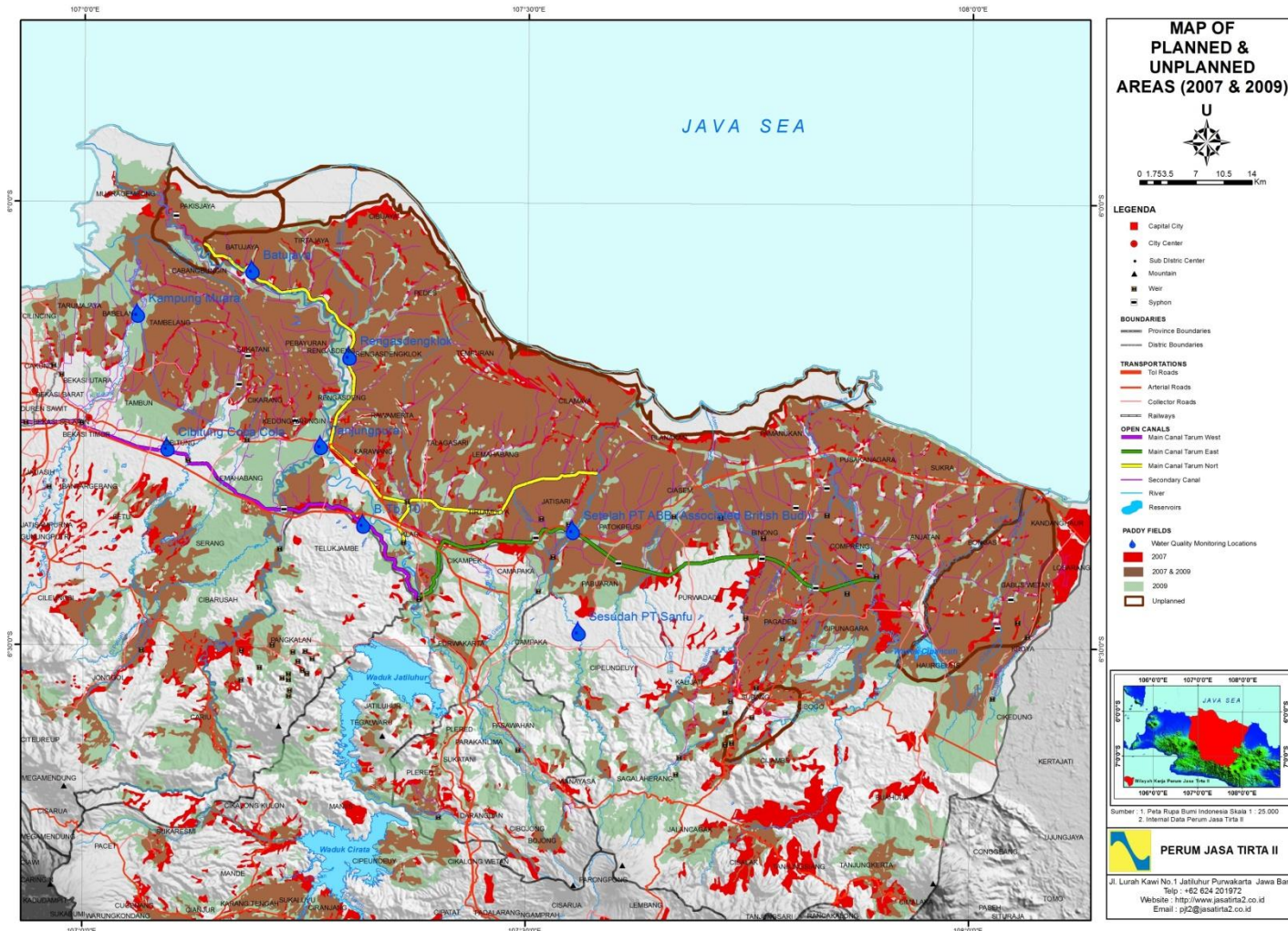
- Developments at outskirts of service areas → agricultural lands transformed into urban and industrial purposes
- Outskirt areas developed → rainfed irrigation into technical agricultural lands
- Agricultural lands in 2007 (red) vs agricultural lands in 2009 (light green). Brown areas indicate paddy fields in 2007 that are still occupied for paddy fields in 2009. Red areas show paddy fields that were transformed into another purposes, such as settlements, industrial areas, etc. Light green areas show the new developed paddy fields.
- National Program in promoting Food Security (10 million tons of rice) → increasing water demand → exceeds water supply
- Possibly trigger and intensify water conflict, especially during dry season



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Map of Agricultural Land Changes



3. Optimizing in Integrated Way

Water Quality Management (Standards applied for irrigation water)

- **Governor Decree No. 39/2000 (Water Allocation and Water Quality Standards at Citarum River and Its Tributaries in West Java) → Group B** for drinking water; **Group C** for fishery and livestock; and **Group D** for agriculture, urban business, industries and power generation
- **Government Regulation No. 82/2001 (Water Quality Management and Water Pollution Control) → First class** for drinking water; **second class** for water recreation infrastructure/facilities, freshwater fish farming, animal husbandry, irrigation; **third class** for freshwater fish farming, irrigation, and **last class** for irrigation
- **Governor Decree No. 12/2013 (Water Quality Standards and Water Pollution Control at Cimanuk, Cilamaya and Bekasi River)**. Each river is **segmented** with its **own standards** based on several criteria.

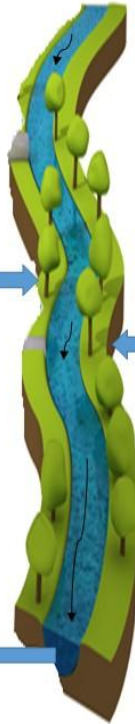
Monthly basis water quality monitoring (90 locations in reservoir, rivers and canals)



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Waste Water Usage for Irrigation



Secondary Canal Bekasi North 10 (B. But. 10)



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Waste Water Usage for Irrigation

Secondary Canal Kedunggede 49 (B. Kg. 49)





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Waste Water Usage for Irrigation

Secondary Canal Kembang



Secondary Canal Sungapan



Waste Water Usage for Irrigation

The practical way out taken by the farmers is using wastewater as their alternative source of water (simplified condition in the field shown in the previous slides). It is done by using several approaches, for instance using pumps to deliver water from existing source of water to their paddy fields. Wastewater here means waste water from domestic, agricultural and other activities that are discharged back into the system, whether it is carrier or even drainage canal.

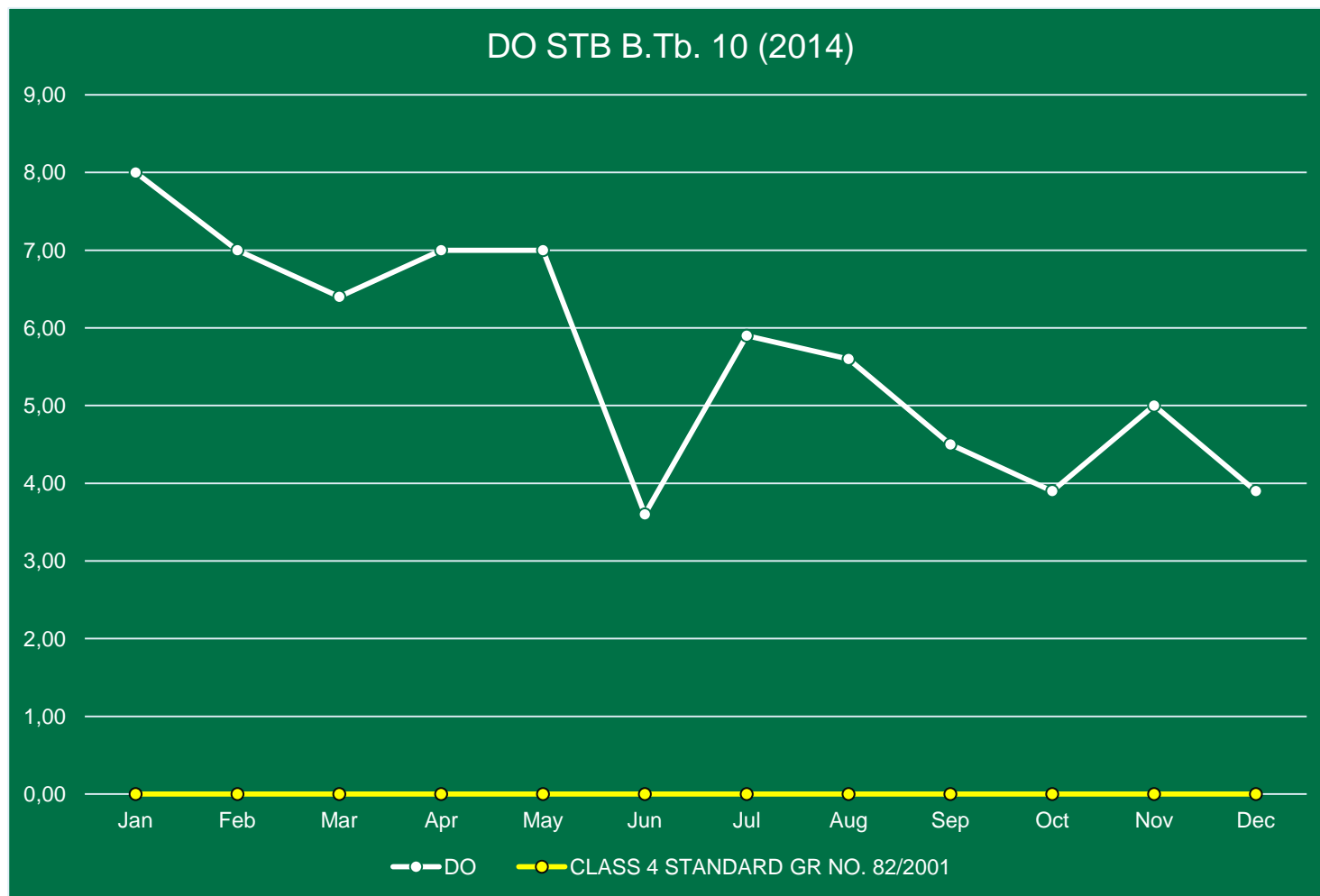
In order to comply with the standards, several quality measures are done in monthly basis. Samples are then analyzed at the laboratory and the results are reported to the Provincial Environmental Agency (BPLHD Jawa Barat). Some of the results are shown in the next slides.



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Water Quality Monitoring Results

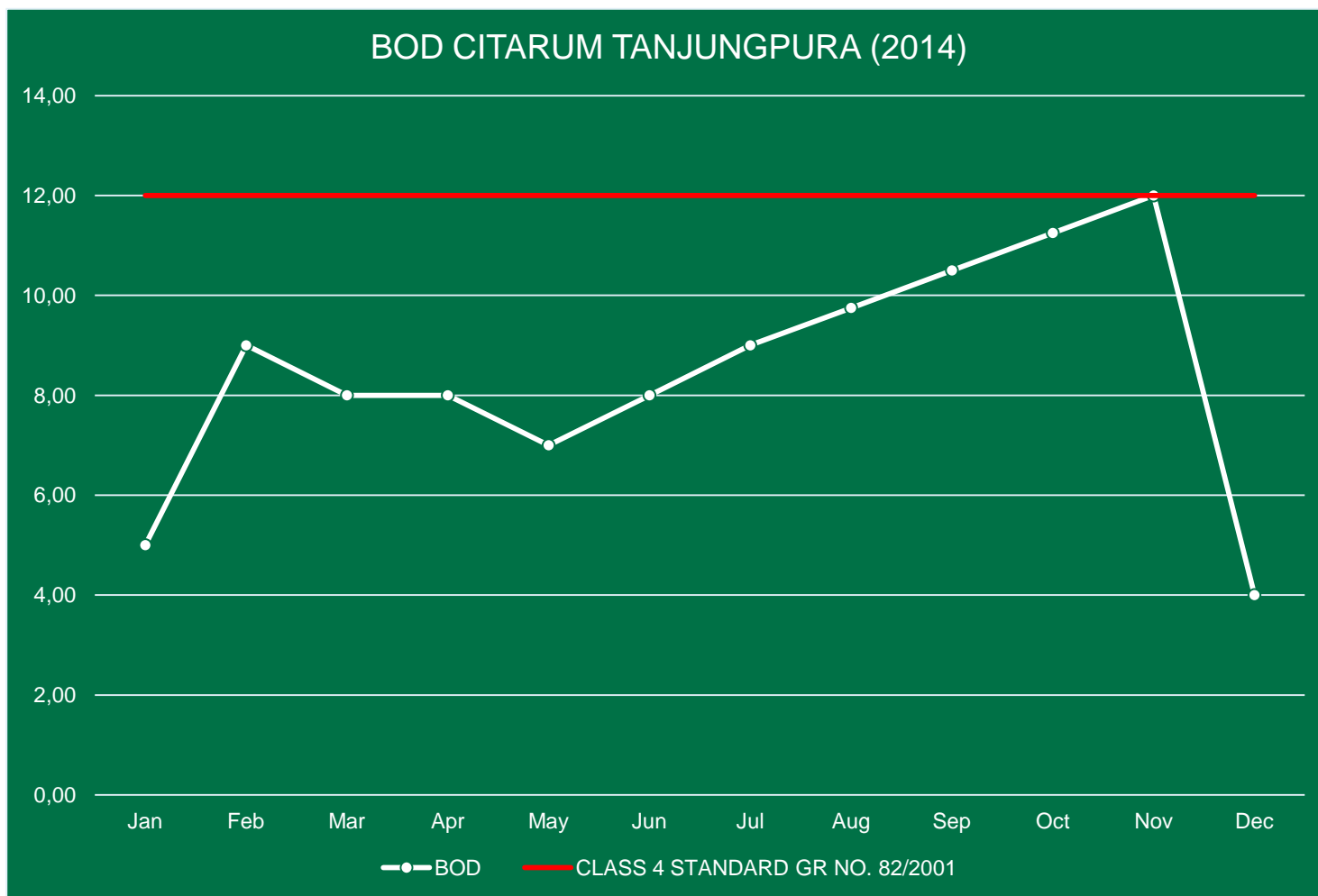




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Water Quality Monitoring Results

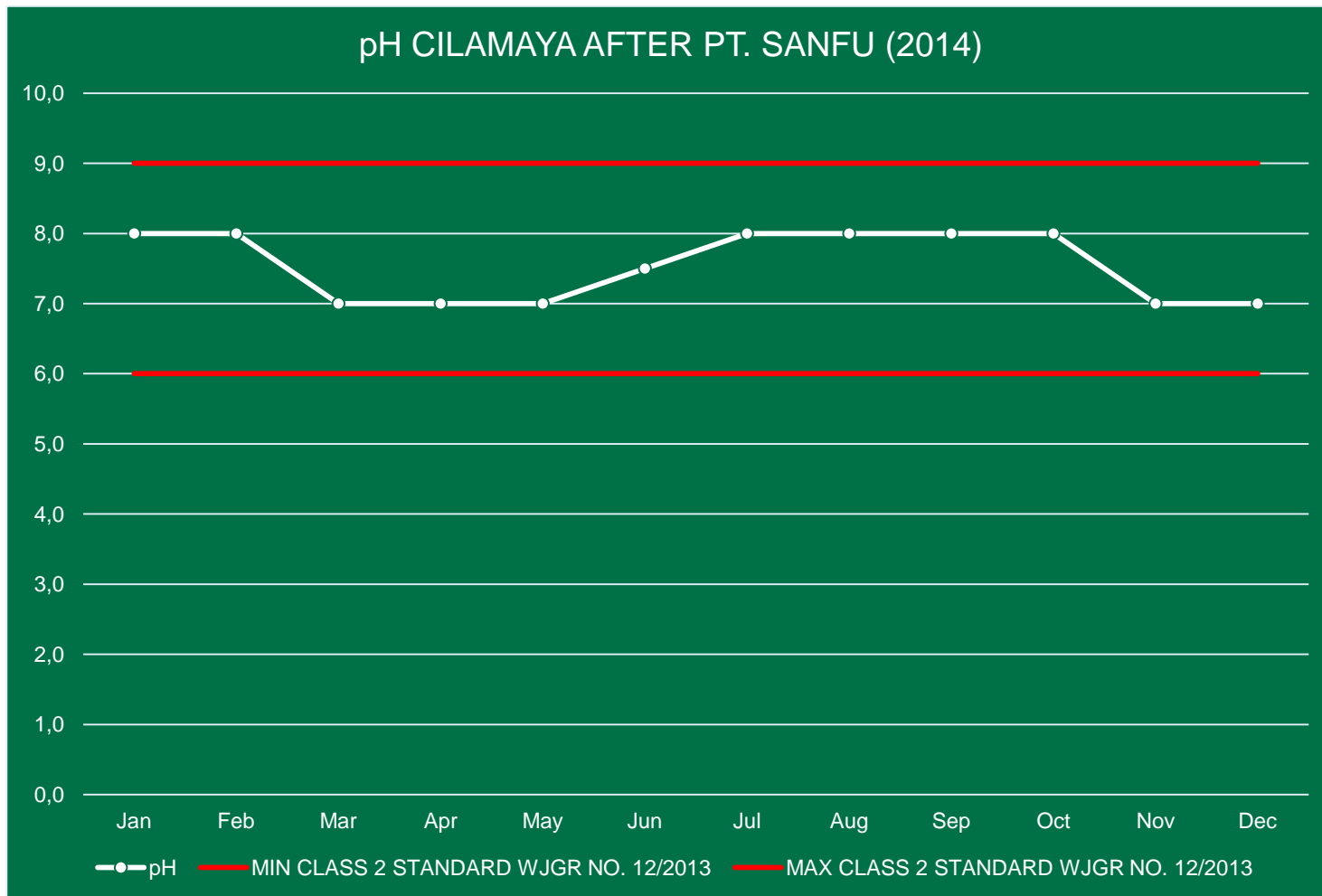




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Water Quality Monitoring Results





4. Conclusion

- Growing human activities have impacts on demand → new developed and developing areas
- Transformation from agricultural lands also followed by emerging new agricultural lands → suppress water supply → alternative sources
- New agricultural lands use water from any nearest available sources since they do not have any other sources
- Waste water from industries, households and other activities discharged back into the water body
- Water quality monitoring should be done to comply with the standards for irrigation as stipulated
- In overall, the water quality on monitoring points relatively still comply with the standards



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Thank You

**Any questions or comments
are most welcome**