WASTEWATER USE FOR IRRIGATION IN JATILUHUR INTEGRATED IRRIGATION SYSTEM

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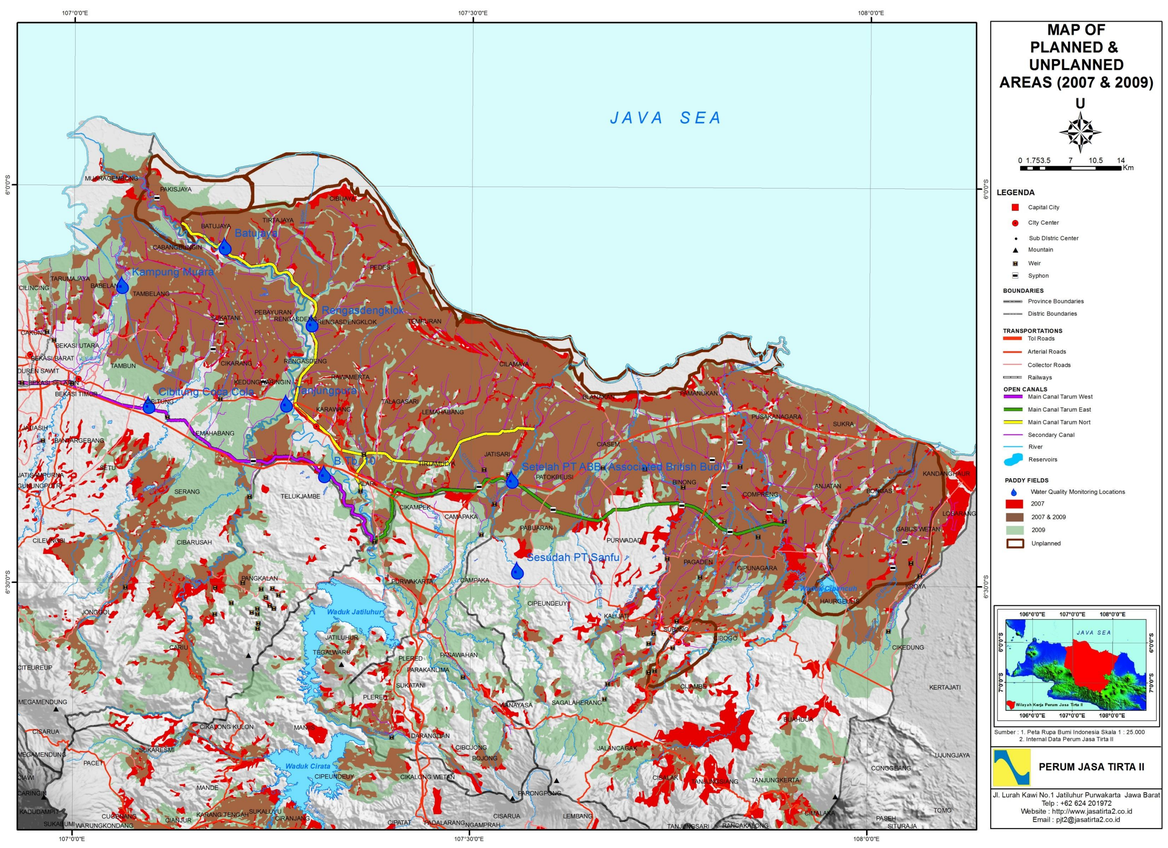
DESCRIPTION

Irrigation Areas

Jatiluhur Integrated Irrigation System (JIIS)

As the largest technical irrigation system in Indonesia, JIS serves 240,000 ha of paddy fields, stretched between two provinces (West Java Province and DKI Jakarta Province) since operated in 1967, by combining existing irrigation systems that were built during the Dutch colonialism (Salamdarma system in 1923 and Walahar system in 1925). It has been supporting the rice production in Indonesia since 1980s, when the development of water resources infrastructures completed. It covers approximately 12,000 km^2 of river basin; starts from Cilalanang River up to Ciliwung River. Saguling, Cirata and Ir. H. Djuanda Reservoirs, known as Citarum cascade reservoir, are the three big reservoirs in Citarum River, added by several potential local sources along the system (West, East and North Tarum Canal). These canals supply water for irrigation, domestic, municipal and industries.

Figure 1: Map of Agricultural Land Changes



DEVELOPMENT OF PROVISION

Growing Human Activities

Land Use Changes and Outskirt Developments

As the result of growing population and human activities, there are some developments at the outskirt of the service areas. On one hand, many agricultural lands have been transformed into urban and industrial purposes. On the other hand, some of the outskirt areas have been developed from rainfed irrigation into technical agricultural lands. The figure above shows the agricultural lands in 2007 (red) and agricultural lands in 2009 (light green). Brown areas indicate paddy fields in 2007 that are still occupied for paddy fields in 2009. Therefore, the remain 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. One of the reasons probably because of the National Program in promoting the Food Security Surplus for about 10 million tons of rice. This activity eventually has increase the water demand and exceeds its water supply. Furthermore, it could possibly trigger and intensify water conflict among users, especially during dry season.

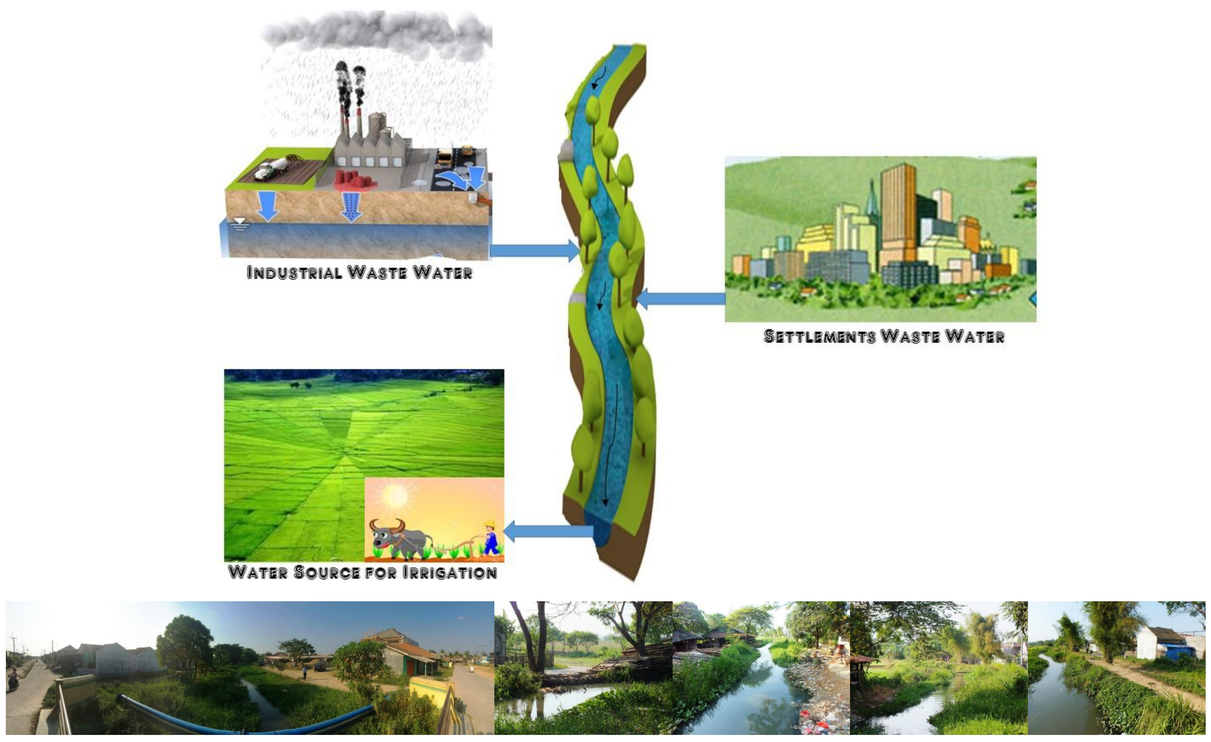
HOW TO MANAGE IN INTEGRATED WAY (OPTIMATION)

Water Quality Management

Standards Applied for Irrigation Water

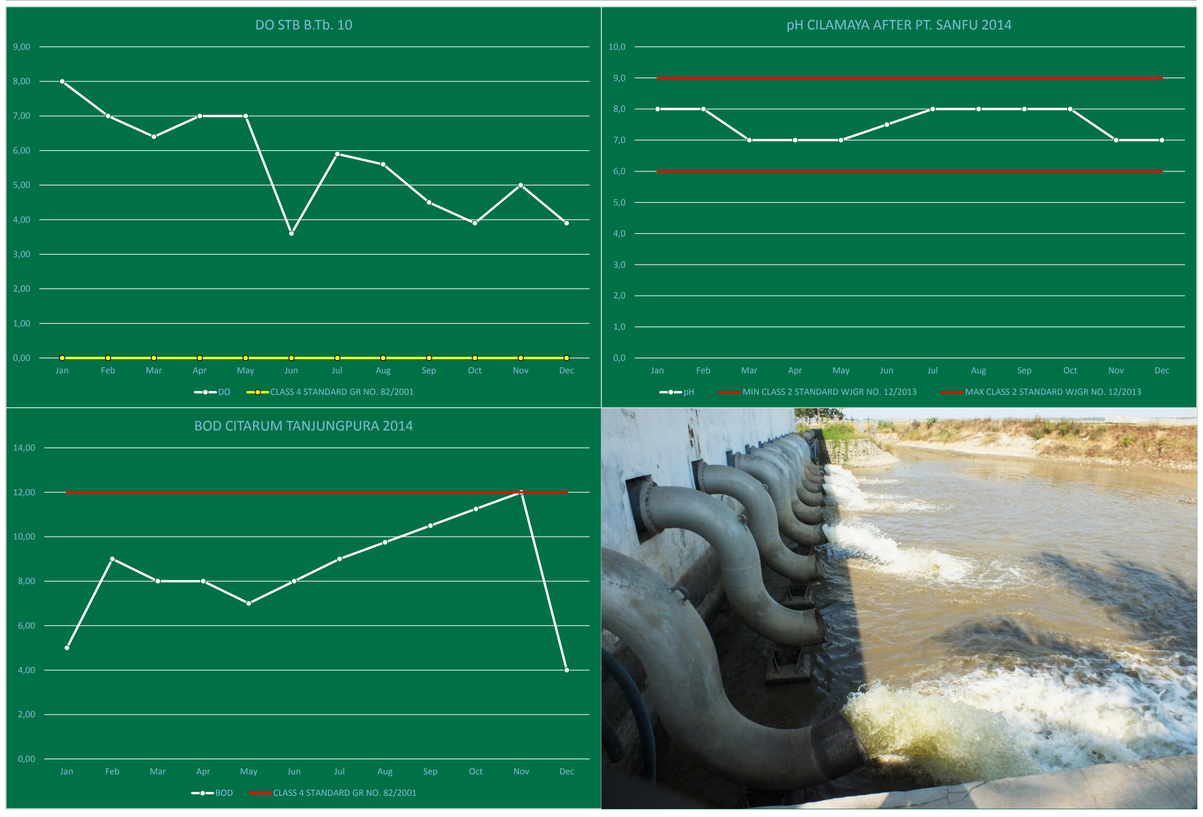
Given the facts that water users in the basin are highly dependent on water supply, another issue has been risen to the surface. In reality, these practices should always be monitored, concerning the availability of water in term of quantity and quality as well, in order to fulfill downstream demand. To ensure the water quality in the basin, there are several standards applied. The first one is **Governor Decree No. 39/2000 on Water Allocation and Water Quality Standards at Citarum River and Its Tributaries in West Java**. The allotment is classified into three groups. **Group B** is for drinking water; **Group C** is for fishery and livestock; and **Group D** is for agriculture, urban business, industries and power generation. The second standard is **Government Regulation No. 82/2001 on Water Quality Management and Water Pollution Control**. In this regulation, water quality classification defined into four classes. **First class** is for drinking water; **second class** is for water recreation infrastructure/facilities, freshwater fish farming, animal husbandry, irrigation; **third class** is for freshwater fish farming, irrigation, and the **last class** is for irrigation. The last standard is **Governor Decree No. 12/2013 on Water Quality Standards and Water Pollution Control at Cimanuk, Cilamaya and Bekasi River**. Each river is **segmented** and each segment has its **own standards** based on several criteria. Having those standards, water quality monitoring are done on a monthly basis. There are 90 locations spread in reservoir, rivers and canals.

Figure 2: 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 above). 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.

Figure 3: Water Quality Monitoring Results & Pumping Activity in the Field



Conclusion

Water quality monitoring should be done to comply with the standards for irrigation as stipulated. Waste water from industries, households and other activities discharged back into the water body. At the downstream, the new agricultural lands use water from any nearest available sources since they do not have any other sources. The blue water drop markers in the first figure represent some of the water quality monitoring points. Some of the results are shown above. It indicate that in overall, the water quality on those points relatively still comply with the standards.