



## **Long Storage Design Optimization for Flood Control and Ecotourism in the Downriver of *Kali Kemuning***

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### **Abstract**

In consequence of various factors coming from the upriver to downriver, frequent flooding in Kali Kemuning (“Kali” means river) is relatively arduous to deal with. Flooding in the upriver areas is caused by low capacity watershed. This problem is solved by implementing a Land Conservation Strategy of combined actions of maximizing the amount of rainwater seeping down to the ground, and providing irrigation water. Moreover, the tides at the Kali Kemuning estuary affect flooding in Sampang city as they carry the backwater which rises the river water level during the flood. To deal with this effect, the control system performance needs to be maximized by making: (1) temporary water reservoirs, (2) floodgate, and/ or (3) pump. The flooding in the middle of the river is caused by channel narrowing that leads to reduced river capacity. Channel normalization through riverbed deepening in the downriver is obstructed by tidal elevation. Nevertheless, river channel widening requires land acquisition which is a no easy task to do if the river channel flows through urban areas. Eventually, the river capacity is increased by installing vertical walls of steel file types and deepening the river beds. This strategy can increase the capacity of flood distribution and storage. The temporary storage capacity of river channel normalization can contain 33,000 m<sup>3</sup> of the river water. Conclusively, community participation is increased by utilizing normalized river channels for tourism purposes, such as boating, and inland fisheries. These activities are expected to improve the economy and public awareness.

### **Keywords**

Urban Flood, Irrigation System, Retention Pond, Pump.