

RESEARCH AND DEVELOPMENT ON INTEGRATED LAKE BASIN MANAGEMENT PLAN FOR BUKIT MERAH LAKE, PERAK

STATE OF LAKE BASIN HEALTH

BUKIT MERAH RESERVOIR

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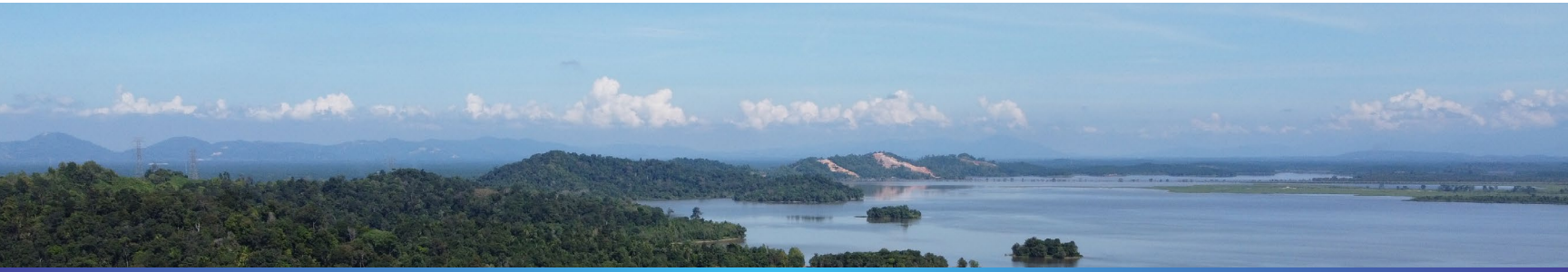
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Executive Summary

The lake continues to be known as a golden arowana habitat and home to various species of fish for the local community. Nevertheless, the lake has great value in terms of recreational potential, history and nature conservation.

Several assessments of the lake's state, including those pertaining to water quality, biodiversity, ecosystem services, economy, and governance, were carried out as part of the research and development of the Lake Bukit Merah Integrated Lake Basin Management Plan.

The Bukit Merah Reservoir is one of the most important man-made lakes in Malaysia. Since its creation in 1906 by damming the Kurau River, the function of the reservoir, which was originally used for irrigation, has been expanded to include flood protection and water supply. The water from the dam flows through the Main and Selingsing Canal to irrigate more than 15,000 hectares of the Kerian Irrigation Scheme. The water was tapped for drinking at two water intakes in Semanggol and Alor Pongsu.

Over the years, sedimentation occurred in the reservoir, reducing its size and storage capacity. The lake is constantly subject to experiencing heavy infestation of native and non-native macrophytes such as *Hanguana malayana* and *Cabomba furcata,* which contributes to sedimentation. Water quality showed signs of deterioration due to nutrients and sediment. Biologically, the phytoplankton

community is fluctuates with the dominance of diatoms, blue-green algae and green algae. Certain areas have low diversity of phytoplankton and zooplankton. The lake continues to be known as a golden Arowana habitat and home to various species of fish for the local community. Nevertheless, the lake has great value in terms of recreational potential, history and nature conservation.

The estimated annual conservation value for Bukit Merah Reservoir, based on the contingent valuation method is RM10.5 million. Using an 8% discounted rate, the estimated net present value (NPV) for conserving Bukit Merah Reservoir is RM142 million, with the NPV ranging between RM127 million and RM157 million. This figure represents the Bukit Merah reservoir's asset value under sustainable management for environmental preservation. Therefore, the potential yearly tourism benefit or consumer surplus using the travel cost method for Bukit Merah Reservoir is estimated at RM14.7 million. The estimated recreational benefit, assuming an 8% discount rate, is RM183.9 million if the lake is managed sustainably. Based on a 30-year management plan with a discount rate of 8%, the total recreational benefit is estimated at RM165 million.

A governance analysis based on stakeholder consultations and input from various agencies and organizations in Perak showed that pressures from land use activities in the catchment and conflicting multiple ecosystem services are impacting the health of the lake. Immediate management actions such as lake buffer monitoring, lake use and activity zoning, pollution source control, invasive species removal and sediment removal are critical to maintaining lake health.

