

CHAPTER V

CONCLUSION AND SUGGESTION

5.1 Conclusion

Based on the findings and analyses conducted throughout this study, the following conclusions are:

1. The Water Quality Index (WQI) of Teknologi Lake (FPTV), calculated using the Malaysian National Water Quality Standards (NWQS), ranged between 59.66 and 73.63, which classifies the lake as slightly polluted. This condition is mainly influenced by elevated levels of BOD (7.25–21.46 mg/L), COD (14–46 mg/L), and ammoniacal nitrogen (0.31–1.46 mg/L). These pollutants are primarily derived from stormwater inflows around D2 and D3, which receive runoff from the FPTV building and mosque area, carrying organic debris and nutrient-rich residues into the lake.
2. The Carlson's Trophic State Index (CTSI) ranged from 61.43 to 70.32, indicating a eutrophic state characterized by high biological productivity. Elevated concentrations of total phosphorus (0.10–0.20 mg/L) and chlorophyll-a (12.99–45.45 µg/L), together with low Secchi depth (0.8–1.15 m), point to ongoing nutrient enrichment that reduces water clarity and encourages algal growth. These eutrophic conditions are sustained by phosphorus inputs from stormwater runoff and internal sediment release under limited water circulation..
3. Correlation analysis showed that WQI was significantly and negatively correlated with BOD ($r = -0.664$, $p < 0.01$), COD ($r = -0.650$, $p < 0.01$), and $\text{NH}_3\text{-N}$ ($r = -0.290$, $p < 0.05$), confirming that organic and nutrient loads are the main factors reducing overall water quality. Meanwhile, CTSI was strongly correlated with chlorophyll-a ($r = 0.860$, $p < 0.01$), total phosphorus ($r = 0.844$, $p < 0.01$), and Secchi depth ($r = -0.884$, $p < 0.01$), demonstrating that nutrient and algal dynamics largely determine the lake's trophic status. The weak correlation between WQI and CTSI ($r = 0.156$) suggests that the two indices capture different but complementary aspects of lake condition, WQI reflects

chemical and oxygen-demanding pollution, while CTSI emphasizes nutrient enrichment and biological productivity.

5.2 Suggestion

Based on the conclusions above, several recommendations are proposed for future monitoring, management, and research:

1. Considering the limited spatial variation across the six inlet points (D2–D6), future monitoring programs may reduce the number of sampling stations and instead focus on representative points with distinct pollution sources or hydrological influence to improve efficiency.
2. Including sediment analysis in future studies could offer deeper insights into pollutant retention and internal loading processes, complementing the current water quality assessment
3. Seasonal and long-term monitoring is recommended to capture delayed eutrophication effects and hydrological changes, especially given that artificial lakes often exhibit lagged responses to rainfall and runoff events due to enclosed catchment dynamics.
4. Improve stormwater management at inflow zones, particularly near D2–D3, by implementing vegetative buffer strips, sediment traps, and regular desilting to reduce pollutant inflows from built-up and landscaped areas.

