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River Pollution in Malaysia: Assessment of Environmental Protection Measures and Sustainable Strategies

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River pollution in Malaysia is a serious environmental and socioeconomic issue, as water quality continues to decline despite government efforts. Although most rivers are still classified as “clean,” according to the Department of Environment (DoE), about 28% are considered slightly polluted or polluted. The main causes of pollution are human activities, especially industrial discharge, agricultural runoff, and illegal dumping. Incidents such as the chemical pollution of Sungai Kim Kim in Johor and the degradation of Sungai Raja Hitam in Perak highlight weaknesses in the current system, including poor coordination among agencies and inadequate enforcement of the law.

Figure 1: Raja Hitam River before pollution



Figure 2: Raja Hitam River after pollution



Note. Reprinted from Sinar Harian

Analysis of Critical Pollution Incidents

The study indicates that human activities are the primary drivers of river pollution in Malaysia. Industrial operations frequently discharge untreated or poorly treated waste into rivers, while agricultural practices contribute to chemical runoff. Additionally, domestic and commercial waste disposal further exacerbates water contamination (Department of Environment Malaysia, 2023). Besides that, weak enforcement mechanisms and insufficient penalties allow such practices to persist (Ibrahim et al., 2021).

This study also contributes to achieving SDG 6 (Clean Water and Sanitation) by addressing stream pollution in Malaysia through integrated, sustainable approaches. It aims to enhance public awareness and community participation by assessing levels of knowledge, attitudes, and behaviours related to stream pollution, and by disseminating information that encourages collective responsibility in protecting freshwater ecosystems.

Figure 3: Site inspections and cleanup at Sungai Kim Kim and Sungai Raja Hitam



Note. Reprinted from Berita Harian

Effective monitoring and enforcement are important for reducing river pollution. Regular inspections help detect pollution early and ensure compliance with environmental regulations (Department of Environment Malaysia, 2023). Although laws such as the Environmental Quality Act 1974 are in place, there are still challenges in implementation. Therefore, better coordination among government agencies is needed to minimise delays and improve responses to environmental incidents (Adnan, 2024).

River restoration involves several key steps that combine technical and practical measures. First, pollutant removal focuses on clearing chemical waste, plastics, and heavy metals from rivers. Second, sediment cleaning involves methods such as dredging and filtration to remove toxins that settle on riverbeds. Finally, water treatment employs mobile treatment systems and biological processes to improve water quality and ensure compliance with safety standards.

Figure 5. Rehabilitation of Sungai Kim Kim and Sungai Raja Hitam



Note. Reprinted from Utusan

River pollution has severe environmental and public health consequences, particularly among vulnerable populations such as school children. Contaminated water disrupts aquatic ecosystems, leading to biodiversity loss and fish mortality. Human exposure to polluted water and toxic gases can result in respiratory issues, skin irritation, and long-term health risks, including neurological damage (Ibrahim et al., 2021).

Conclusion

River restoration is crucial for repairing damage from pollution and human activities, allowing rivers to return to safe, healthy conditions. Rivers provide freshwater and support biodiversity, agriculture, and local communities, but they are often polluted by industrial waste, illegal dumping, and urban runoff. Restoration efforts typically involve removing pollutants such as chemicals, plastics, and heavy metals, followed by cleaning contaminated sediments that can release toxins over time. Water treatment is then applied to ensure safety standards are met.

However, effective restoration also requires continuous monitoring and strong community involvement to prevent further pollution. Collaborative efforts, as seen in the Kim Kim River and Sungai Raja Hitam initiatives, demonstrate that integrated approaches that combine technical solutions with public participation can significantly improve water quality. Ultimately, river restoration not only improves water quality but also protects ecosystems, public health, and long-term sustainability.

References

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