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Water Quality Management Based on Hydrodynamic Approach, Landuse, and Human Intervention in Wulan Delta Central Java Indonesia: Problems Identification and Review

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Abstract : Delta is dynamics area which is influenced by marine and river. Increasing human population in coastal area and the need of life exert pressure in delta that provides various resources. Wulan Delta is one of active Delta in Central Java, Indonesia. It has been experienced multiple pressures because of natural factors and human factors. In order to provide scientific solution and to analyze the main driving force in river delta, we collected several evidences based on news, papers, and publications related to Wulan Delta. This paper presents a review and problems identification in Wulan Delta, based on hydrodynamic approach, land use, and human activities which influenced water quality in the delta. A comprehensive overview is needed to address best policies under local communities and government. The analysis based on driving forces which affect delta estuary and river mouth. Natural factor in particular hydrodynamic influenced by tides, waves, runoff, and sediment transport. However, hydrodynamic affecting mixing process in river estuaries. The main problem is human intervention in land which is land use exchange leads to several problems such us decreasing water quality. Almost 90% of delta has been transformed into fish pond by local communities. Yet, they have not apply any water management to treat waste water before flush it to the sea and estuary. To understand the environmental condition, we need to assess water quality of river delta. The assessment based on land use as non-point source pollution. In Wulan Delta there are no industries. The land use in Wulan Delta consist of fish pond, settlement, and agriculture. The samples must represent the land use, to estimate which land use are most influence in river delta pollution. The hydrodynamic condition such as high tides and runoff must be considered, because it will affect the mixing process and water quality as well. To determine the samples site, we need to involve local community, in order to give insight into them. Furthermore, based on this review and problem identification, recommendations and strategies for water management are formulated.

Keywords : delta, land use, water quality, management, hydrodynamics
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