

DESIGN OF A ROBOTIC RIVER CLEANING SHIP BASED ON SOLAR PANELS AND CONVEYORS

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ABSTRACT

River pollution caused by waste has become a serious environmental problem in Indonesia, while manual cleaning methods are considered ineffective and hazardous to health. This study aims to design and build a solar panel and conveyor-based river waste cleaning robot ship as a more effective and environmentally friendly solution. The robot ship was built using a pipe hull with a diameter of 11.4 cm, an aluminum frame, a DC 775 motor as the drive, a 30 WP solar panel as the energy source, and a conveyor as the waste collection mechanism. Testing at the Curah Malang River, Jember Regency, showed that the robot ship operated stably across all load variations from 0 kg to 6 kg, with the hull always in a safe condition and the motor maintaining 2,040 RPM without performance degradation. Theoretically, a buoyancy force of 243.09 N was proven sufficient to support the total weight of the ship with a maximum load of 6 kg as planned.

Keywords: Robot ship, river waste cleaning, DC 775 motor, solar panel, conveyor, buoyancy force