

***Analysis Of Biogas Pipeline Modification On Pressure Drop In The Biogas In
Suco Village***

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ABSTRACT

The biogas distribution system in Suco Village utilizes a ½-inch pipe, which creates the potential for significant pressure drop there by reducing gas distribution efficiency at the point at use. This study aims to analyze the effect of pipe diameter modification on the flow rate, pressure, and pressure drop of the biogas distribution system at King Farm, Suco Village. An experimental method was applied by comparing conditions before modification (½-inch pipe) and after modification (¾-inch and 1-inch pipes), all using the same pipe length of 6 meters. Flow rate was measured with a flowmeter and biogas pressure with a fluid manometer for 10 minutes at one-minute intervals, and the major, minor, and total pressure drop were then calculated using the Darcy-Weisbach equation. The results show that enlarging the pipe diameter increased the flow rate and pressure while reducing the total pressure drop, from 0.01430 kPa for the ½-inch pipe to 0.00903 kPa for the ¾-inch pipe and 0.00425 kPa for the 1-inch pipe. The 1-inch pipe provided the best distribution performance with the lowest pressure loss. These findings can serve as a reference for designing more efficient biogas distribution systems in livestock-scale biogas installations.

Keywords: biogas, Darcy-Weisbach equation, distribution system, pipe diameter, pressure drop.