ABSTRACT

Organic waste treatment in Pucanganom village, Gunungkidul is supported by a pilot biogas reactor result of the cooperation between Integrated Water Resource Management-Indonesia (IWRM-Indonesia) with Karlsruhe Institute of Technology (KIT). Biogas reactor is processing dairy manure which in addition producing methane gas, sludge output from the reactor is used as fertilizer. This research was conducted to set-up operation of biogas reactor and to identify reactor performance from technical and non technical aspect. Monitoring and evaluation of biogas reactor performance was held for three months after the reactor was repaired, to analyze the operation of the biogas reactor was done by monitoring and laboratory analysis of several inlet parameters, including moisture content, Total Solid, COD, Dissolved COD and C/N ratio and outlets including Total Solid, COD, Dissolved COD, C: N: P ratio, pH, temperature and gas production. Observation and interview methods were conducted to evaluate the performance of biogas reactor from technical and non-technical factors. The results show that the biogas digester has successfully operated effectively in technical terms based on parameters that has been analyzed, but the biogas volume has not reached the theoretical maximum amount of 2000 l / day. Biogas can fill 11% of the essence need for cooking and help save the purchase of fertilizer for plants. The technical problems that occur are the error of the connection of the gas pipe and the slurry mixed with rainwater because of there's no ditch around the sludge drying bed, the problems has successfully repaired by the biogas users with help from technicians.

Keywords: Biogas, Dairy Manure, Methane, Reactor.

ABSTRAK

Pengolahan limbah organik di Desa Pucanganom, Gunungkidul ditunjang dengan adanya reaktor biogas skala pilot hasil dari kerjasama antara *Integrated Water Resource Management-Indonesia* (IWRM-Indonesia) dengan *Karlsruhe Institute of Technology* (KIT). Reaktor biogas ini mengolah limbah kotoran sapi dimana selain menghasilkan gas metan, lumpur keluaran dari reaktor tersebut dimanfaatkan sebagai pupuk. Penelitian ini dilakukan untuk mempersiapkan operasi reaktor biogas serta mengidentifikasi kinerja reaktor dari segi teknis maupun non-teknis. Monitoring dan evaluasi kinerja reaktor biogas dilakukan selama tiga bulan setelah reaktor diperbaiki, untuk menganalisis operasi reaktor biogas dilakukan dengan pemantauan dan analisis laboratorium beberapa parameter baik inlet yaitu meliputi kadar air, Total Solid, COD, Dissolved COD dan C/N ratio maupun outletnya yang meliputi Total Solid, COD, Dissolved COD, C:N:P ratio, pH, temperatur dan produksi gas. Metode observasi dan wawancara dilakukan guna mengevaluasi performa reaktor biogas dari faktor teknis dan non-teknis. Hasil menunjukkan bahwa digester biogas telah berhasil beroperasi secara efektif dalam segi teknis ditinjau dari parameter yang telah dianalisis akan tetapi volume biogas belum mencapai jumlah maksimum secara teoritis yaitu 2000 l/hari. Biogas dapat memenuhi 11% kebutuhan untuk memasak dan membantu menghemat pembelian pupuk untuk tanaman. Permasalahan teknis yang terjadi yaitu kesalahan penyambungan pipa gas serta *slurry* yang bercampur dengan air hujan akibat dari tidak adanya parit disekitar *sludge drying bed*, permasalahan telah berhasil ditanggulangi pengguna biogas dengan bantuan teknisi.

Kata kunci: Biogas, Feses Sapi, Metan, Reaktor.