INTRODUCTION

Uganda is the second largest global producer of bananas after India and the leading in Africa, with annual production estimated at 9.7 million tonnes [2,4]. The East African highland cooking banana subgroup (AAA-EA group) locally called matooke, is the major grown variety and a leading staple food [5]. However, both production systems and banana fruit processing accumulate large quantities of waste residues comprising rotten/damaged fruits, peels, fruit-bunch-stem (stalks), leaves, fibers, pseudo-stem, and thrones. Banana fruit processing alone has estimated that more than three million tonnes of banana waste are generated annually in the country [5].

Besides, Uganda’s banana industrialization relies mainly on costly imported petroleum products for fuel energy and is grappling with inadequate and expensive energy [3]. Hence, utilization of banana waste as feedstock for energy production to relieve the banana industry from both energy scarcity and reliability can be the best option and first priority for managing banana waste in Uganda. Among the applicable waste-to-energy technologies, anaerobic digestion to generate biogas has been recommended as the most appropriate for biomass with high moisture content such as banana waste [3].

OBJECTIVES

The objective of this research study was to assess the key steps in processing of green bananas into pulp, and auditing and characterization of the major resulting residual wastes namely peels, peduncle (fruit-bunch stalk) and fruit discard, in order to evaluate their potential as feedstocks for biogas production.

METHODOLOGY

The study was undertaken following a reconnaissance visit to western Uganda (figure 1), the highest banana producing region in Uganda [6]. The study was conducted for a year and data was collected through guided survey along the processing plant, open-ended interviews, photography and sampling for laboratory analysis.

RESULTS

Banana waste samples for laboratory analysis were collected from different processing streams and transported to the laboratory for analysis and biogas production experimentation at the Department of Biochemistry, Makerere University, Kampala-Uganda.

Sampling was done four times at an interval of three months for one year; between January and December 2015. At the laboratory, raw banana waste samples were shredded into a homogenous paste (figure 2) using an organic shredder (TR 200: Organic Shredder, BrafzAeric Enterprises LTD).

Table 1: Current methods for management of banana waste

Table 2: Residual fractions from processing of green bananas

CONCLUSION

The huge banana wastes generated and currently underutilized are rich in organic matter with high moisture content and thus a good substrate for biogas production through anaerobic digestion. Appropriate pre-treatment of its lignocellulosic content would be required to enhance its digestibility and improve biogas yield.

REFERENCE


ACKNOWLEDGEMENT

This research was supported by the RELOAD project.