

Waste 2 Power

A Study on biogas generation from organic municipal waste collected in the City of Moroni

UC Davis, D-Lab 1

Madeleine Jones, Susana Ramirez, Joyce Tse

Background

- ❖ **Mission:** Complete a feasibility study for constructing a waste electric station which inspires local communities to participate in waste sorting and environmentally sustainable practices.
- ❖ The Comoros Ministry of Environment saw this as a two-fold opportunity: the biodigester will address the issue of effective waste management and influence the use of more renewable energy sources to begin improving the reliability of electricity.

Context

- ❖ Waste is primarily collected from the City of Moroni
 - Local markets & households
- ❖ 9% of the households pay an **eco-tax** implemented as of October 2017
 - \$3.75 per month



Moroni market where most waste is collected. It can take up to a month or 2 without being collected.

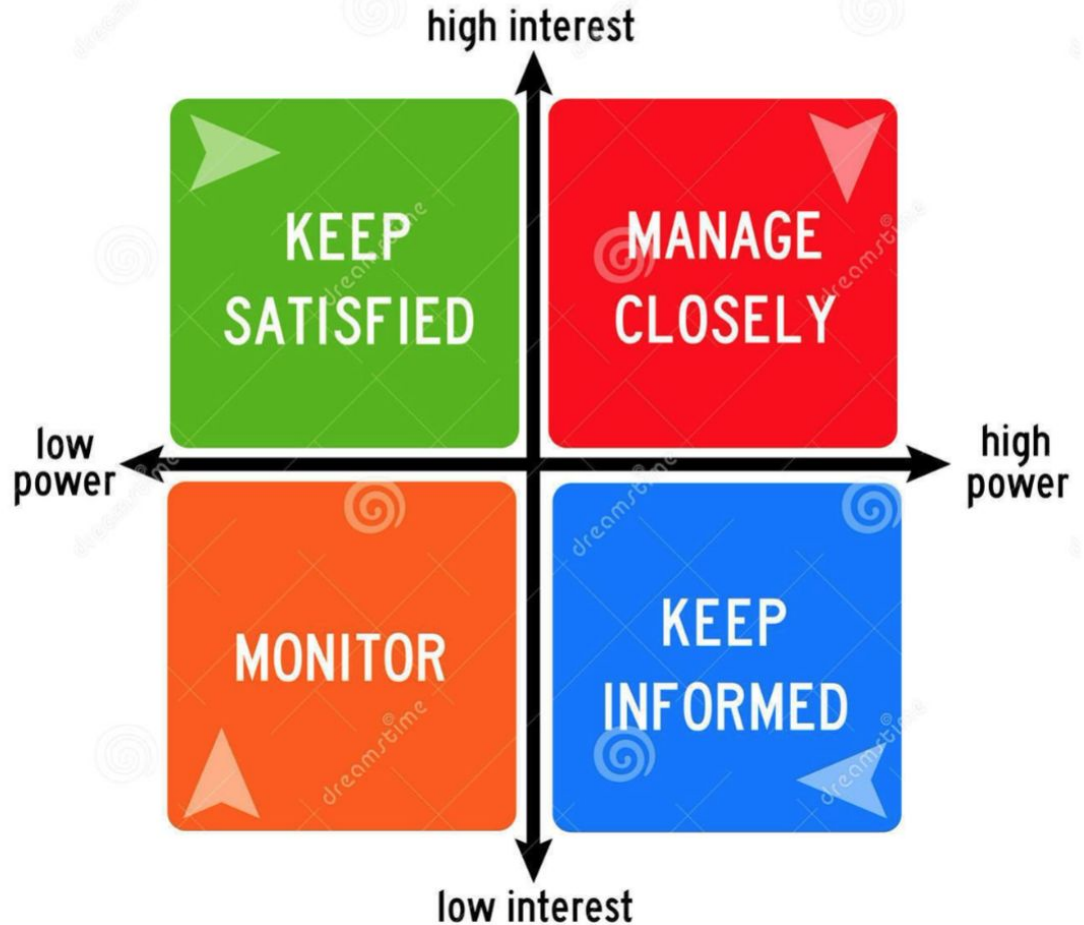
Methodology

The following tools allowed us to provide recommendations based on the project's feasibility:

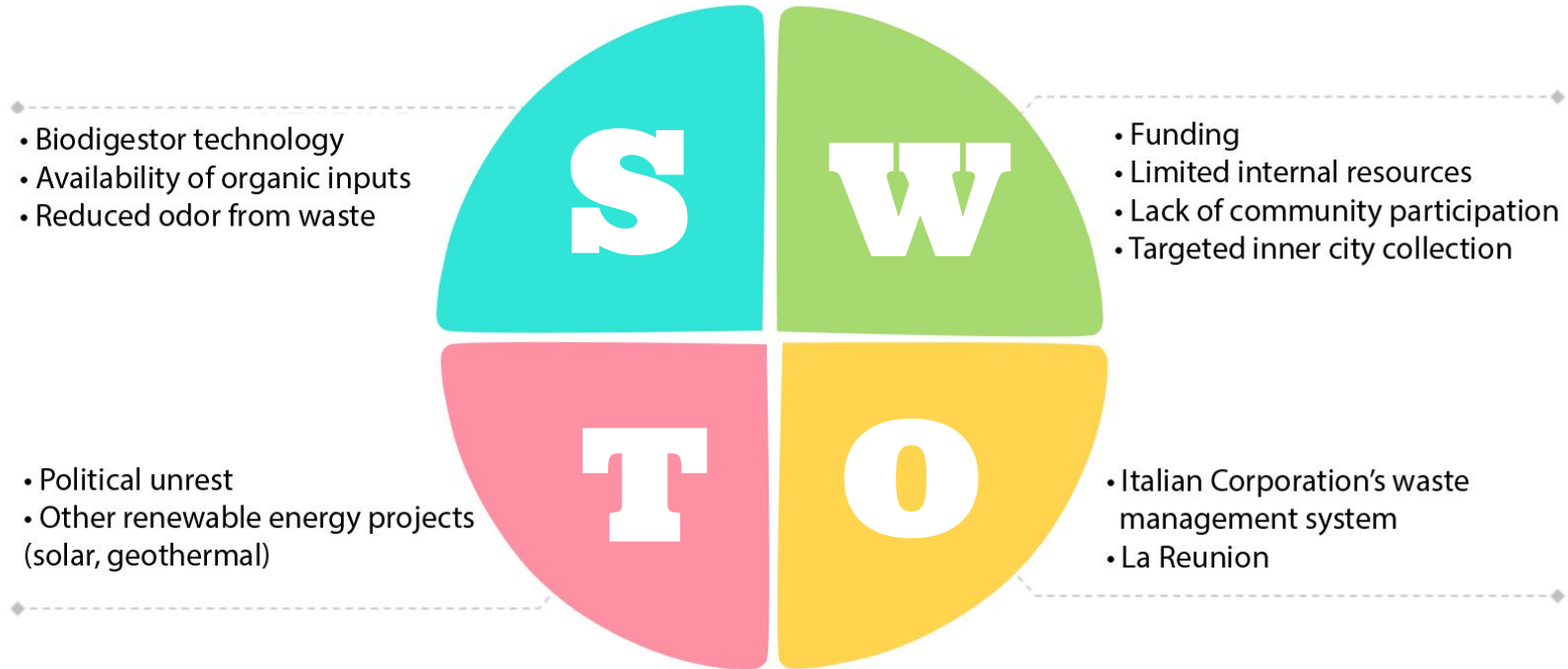
- ❖ Proper identification and analysis of stakeholders
- ❖ Strengths, Weaknesses, Opportunities and Threats to better understand implementation in context of Comoros' current condition
- ❖ Literature review for biodigester availability

Stakeholders Analysis

- ❖ UC Davis D-Lab
- ❖ Ministry of Energy; Media
- ❖ Catarina SPA; Local authorities
- ❖ BYD; EU, UNDP, World Bank



SWOT ANALYSIS



Literature Review

- ❖ South Africa's marketing strategies and development of biogas industry
- ❖ Different energy production depending on type of waste (agricultural, municipal)
 - Nigeria and other developing countries primarily utilize manure and cash crops



Bioreactor implementation in the Island of La Reunion.
Source: Solid Waste Management In Reunion Island. (2012).

Recommendations

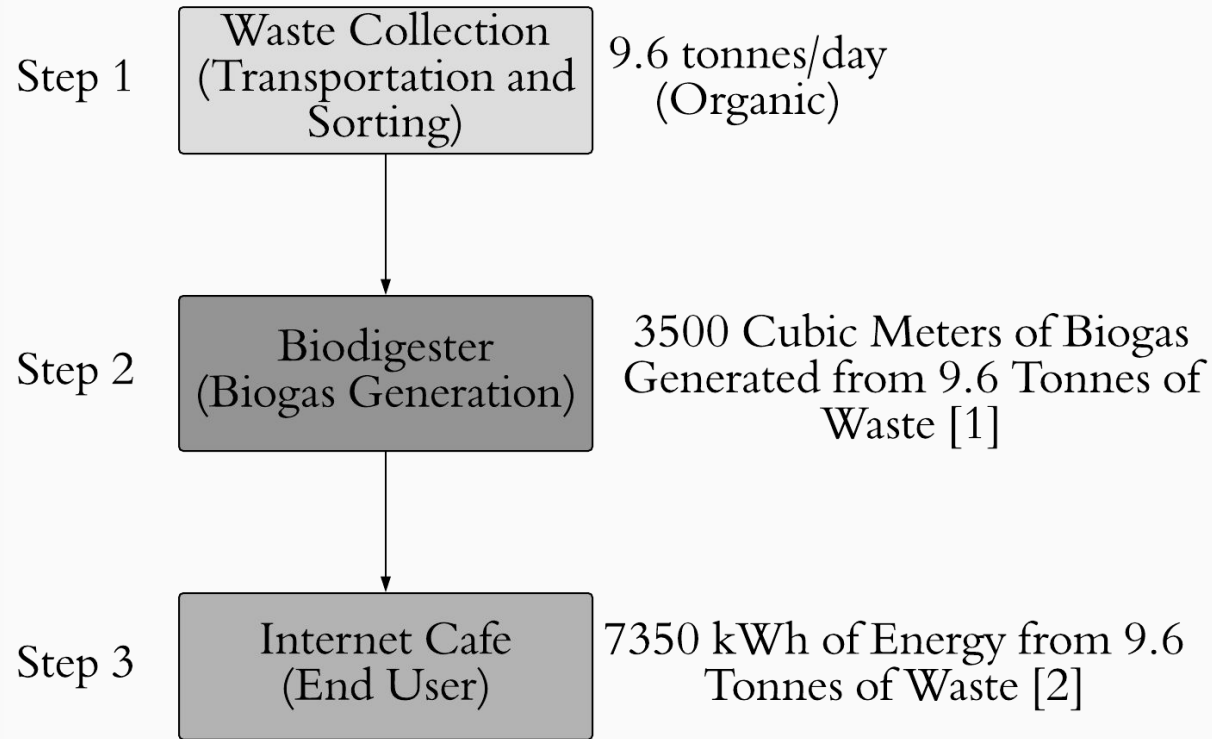
- ❖ Distribute survey in community and establish community participation
- ❖ Professional consultations regarding biodigester construction/cost
- ❖ Develop a professional relationship with La Reunion

Thank you!

Energy Output Potential

A conservative estimate suggest a 7.35 MWh/day potential energy output from current collected municipal waste.

Online Calculator estimates 2.69 MWh/day energy potential



Source: 1. Curry, N., & Pillay, P. (2012). Biogas prediction and design of a food waste to energy system for the urban environment. *Renewable Energy*, 41, 200-209. doi:<https://doi.org/10.1016/j.renene.2011.10.019>
2. http://www.electrigaz.com/faq_en.htm

Energy Consumption for 2017

