

Integrated Solid Waste Management Solutions for Puerto Rico: Small, Replicable Steps Towards Achieving Drastic Changes



Faculty Advisor: Héctor J. Cruzado, PhD., PE
Hanna K. Rodríguez, PE, SC
Polytechnic University of Puerto Rico

Abstract

This project recommends strategies for developing an Integrated Solid Waste Management Plan for Local Government Units (LGUs), which, in the case of Puerto Rico, applies to Municipal Governments, for their implementation that would include suggestions for agencies' integration towards this effort. These strategies are suggested with the projection that guidelines will be developed and provided to Municipal Governments for the achievement of comprehensive integrated waste management solutions; primarily regionally – based. As a basic strategy, the empowerment of Municipal Recycling Coordinators (MRCs) is herein enforced by providing a strategic plan for education of the MRCs.

Project Scope

Strategies herein recommended are focused on tackling the situation at Puerto Rico's State Government level is the most straightforward way of arriving at a reasonable regionalization of waste management. The idea emerges from the knowledge that "all waste is local" and current laws apprehend the responsibility of waste management at the municipality level. A feasible approach to a solution is herein recommended by way of providing guidelines towards formalizing a regionally-based integrated waste management plan. The idea of tackling the situation at the Municipal Government level is the most straightforward way of arriving at a reasonable regionalization of waste management. Hence, the recommendations are focused on providing guidelines to Municipal Governments by way of Municipal Recycling Coordinators (MRCs) for the achievement of comprehensive integrated waste management solutions.

Literature Review

Figure 2 shows steps to implement in order to stage integrated solid waste management strategies.



Figure 2

Comprehensive Integrated Solid Waste Management (ISWM) Planning Process [12]

Analyses emerging from Figure 2 shall provide enough knowledge in order to define the waste management system components. Comprehensive knowledge of the system currently in place will aid in identifying interrelationships, such as those presented in Figure 3.

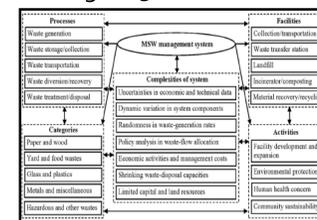


Figure 3

Interrelationships among various systems [11]

MRC Coalition Strategic Plan

The following Strategic Plan is presented in the article as an educated recommendation to the MRC Coalition that includes goals for the first two (2) years and initially identified long term goals. Three major goals pave the way to identified strategic guidelines provided in the article.

MRC Coalition Mission Statement

To support, promote and develop recycling in Puerto Rico.

Introduction

This strategic plan is being presented for the development and growth of the MRC Coalition. This document is meant to guide the MRC coalition through strategies to reach goals identified for the primary purpose of focusing an island-wide view focused on ISWM.

Definitions

MRCs: Municipal Recycling Coordinators
Program Year 1: April 1, 2014 – March 31, 2015
Program Year 2: April 1, 2015 – March 31, 2016
Long term strategies: Strategies to be completed in the next 2-5 years

Goals and Strategies

- Goal 1:**
 - Increase Involvement of MRCs in the MRC Coalition
 - Engage current MRCs in dialogue to understand their educational needs from the MRC Coalition,
- Goal 2:**
 - Foster Professional Development of MRCs
 - Update and integrate PRSWA and SWANA resources and tools that provide MRCs the basic information to perform in their positions.
- Goal 3:**
 - Create or promote synergy for divisions charged with waste management responsibilities (Public Works Authority, Permits Offices, etc.) within the municipality.
 - Suggested strategies to be coordinated through the MRC Coalition are provided in the article.

Acknowledgments

- SWANA Caribbean-PR Board
- Mrs. Elizabeth Aviles, MRC Coalition President (CCOREM, per its Spanish acronym)
- Puerto Rico Recycling Partnership (PRRP)

Introduction

The lack of integrated solid waste management (ISWM) efforts and coordination from all sectors has severely compromised the effectiveness of the system throughout the Caribbean. The Solid Waste Association of North America (SWANA) defines ISWM as "a series of complimentary actions dedicated to reducing the amount of solid waste generated and managing that which is generated in an economically and environmentally sound manner" [1].



Each island is confronted with a unique situation that range from gubernatorial complications to geographical location. But throughout the Caribbean, this situation presents immeasurable environmental problems.

Literature Review

Waste reduction precedes efforts to be performed once the waste is generated: reuse, recycling, energy recovery, treatment, and disposal; refer to Figure 1.

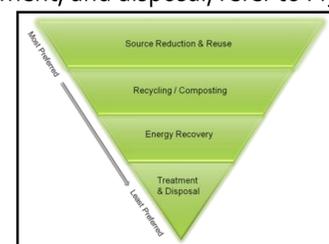


Figure 1

Waste Management Hierarchy [5]

ISWM Plan Recommendation

Strategies developed by the PRRP are precisely the implementation goals the state government must act on in coordination with regional and municipal efforts herein suggested. Firsthand knowledge of the dedicated time, efforts, and professional quality of the PRRP and the corresponding report are hereby reiterated by a founding member of the PRRP.



Figure 7

ISWM Goals as delineated by the PRRP [10]