

**COMMUNITY-BASED RAPID BIODIGESTION:  
AN EXPERIMENT ON GARBAGE TECHNOLOGY**

**A Special Problem  
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## Chapter I

### INTRODUCTION

Garbage poses a major problem in a developing country like the Philippines. At least 1% of the National Gross product (GNP) is consumed for solid waste management, draining the already thin resources of the Philippines (Perez, 1990). Ironically, despite consuming a big portion of government budget, the garbage problem has never been satisfactorily solved; resulting in unclean, unsightly, foul smelling streets and neighborhood.

The average resident in the city generates about 0.52 kg of household refuse per day. About 94,000 tons of municipal solid waste generated for the year 1989, and this figure is currently expected to grow at an annual rate of 6%. It is expected for the waste quantity to increase by 175,000 tons in the year 2010.

The solid waste disposal system as used in the city has many drawbacks namely: 1) land is limited and a high price resource especially in urban areas; 2) leachates from landfill become a problem when the groundwater in surrounding areas is rendered useless due to contamination; 3) open dumping system could also create breeding grounds for pathogens leading to outbreaks of disease (Cuales, 1988). It is worthy to note that despite its adverse effects, open dumpsite remains the waste management system in Bacolod City today.

Solid waste includes waste produced from public markets, commercial and industrial (63% by volume), residential (35%), and hospital (2%). The approximate composition of garbage generated by weight are: food and kitchen waste, 51.2%; paper 20.3%; yard

waste, 7.7%; plastic 6.0%; tin, 5.0%; cardboard, 4.7%; glass, 2%; textile, 1.3%; rubber, 1.1% (Cuales, 1988).

About 70% of the garbage thrown everyday in Bacolod City is biodegradable and are gathered largely from market, residential and industrial sources. Fifty percent of the garbage is ideal for composting (DPS, 1998).

Recycling, reusing and composting are among the major strategies used to lessen the urban refuse (Manila Bulletin, 1997). Composting is by far the most responsible technical solution for many developing countries where the climate is arid and the soil is in serious need of organic supplements. (Holmes, 1984).

There are drawbacks that discouraged operators from composting, this includes uncontrolled odor, sanitation and the period of composting, which take two to three months at ordinary time. A longer composting period takes larger area for operation, with more labor force, posing problems in maintenance and sanitation. The absence of technology that addresses the perceived problems in composting has prevented the local operators from considering composting as a waste management alternative in their locality.

In the Philippines, there are at least two reported localities that use composting as a waste management strategy. The municipality of Sta. Maria in Bulacan, uses market waste, rice hull, ashes from rice hull, animal manures and chemical additives to produce organic fertilizer (Cuevas, 1998). They also use the species of fungi called trichoderma as an activator for rapid composting. Cavite on the other hand experimented on bacteria as inoculums. They experimented on a mechanized composting drum of 1.5-ton capacity

developed by the Department of Science and Technology which can generate compost in four days.

The Department of Agriculture, UP Los Baños and the National Council for Rapid Composting has come up with procedures on composting of farm waste but none on urban waste.

There are two reported compost operators in Negros Occidental today, one uses bagasse and mud press as done by Victorias Milling Company, and the other uses farm waste and animal manure as done by V-4 farms. In Bacolod, composting of urban waste has always been foreseen as an alternative waste management strategy in the city.

Compost as a product of composting provides the following benefits: (Zamora, 1996) (1) supplies nutrients to plants with long-term residual effects., (2) improves the structure of the soil, (3) improve water holding capacity; (3)minimizes soil erosion, (4) increases microbial population and encourages earthworm population, (5)aerates soil; reduces root rot, reduces incidence of plant diseases and insects attacks, (6) darkens soil to absorb sun's rays and kills weed seeds, (7)maintains balance of soil fertility and high energy level.

Composting is income generating and could be self-sustaining if properly managed. It has both an economic and ecological advantage. It generates job, helps solve waste management problem and saves landfill. It produces soil conditioner, which reduces fertilizer application resulting to increase food production and dollar saving from imported fertilizer.

The use of compost will help increase the income of the farmers through increase production and up to 25% reduction in the use of commercial fertilizer (Zamora,1996).

A ton of compost can be substituted to a sack of commercial fertilizer. Compost are not only good substitute for commercial fertilizer, it also reconditions the soil by replenishing basic elements removed by erosion, over planting and other harmful farming practices.

It is within this frame of reference that this study is conducted.

### General Objectives

This study seeks to formulate and package an effective urban waste biodigestion technology applicable to the urban poor in Bacolod City.

### Specific Objectives

Specifically, the study aims to:

1. Identify urban waste applicable to composting
2. Develop a rapid composting technology applicable to urban waste in Bacolod City
3. Find the correlation of the rate of decomposition with % moisture, C: N ratio, temperature and oxygen content of compost.
4. Test the technical viability of compost making through rapid decomposition of urban waste.
5. Package an information technology for compost production in Bacolod City.