

De La Salle Santiago Zobel - Vermosa Campus

The Comparison of Recyclable Materials for Water Container Construction using Plastic Bottles and Aluminum Cans



A Research Presented to the Senior
High School Faculty
De La Salle Santiago Zobel School
Vermosa Campus
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Introduction

Background of the Study



- Less-developed countries lacking waste management practices face a pressing plastic pollution crisis (Mansour & Ali, 2015).
- These materials can be recycled into useful objects like compacted plastic bottle bricks and composite materials (Shoag & Rahman, 2021; Al-Saffar & Bdeir, 2008).
- Structural integrity and durability of plastic blocks and aluminum have been proven (Chow & Muhammad Amin, 2020; Yuan et al., 2012).

Thesis and Research Gap

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1. contribute to reducing plastic waste
2. create an eco-friendly infrastructure
3. guide the scientific community

This study infers that a water container constructed using compact plastic bottle bricks or aluminum cans possesses structural integrity and high durability.

1. long-term durability
2. availability to the community
3. presence of water contamination

Objectives

Comparison

Investigating whether creating a water container out of plastic bottles and aluminum cans is feasible

Flexibility

Helping De La Salle Santiago Zobel partner communities that experience issues resembling those in Sitio Makabuhay,

Structure

Filling the spaces between the plastic bottles and aluminum cans to make the water container durable

Product

Creating a water container that can withstand harsh weather conditions



Statement of the Problem

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Research Questions

How durable and effective is the use of aluminum cans and plastic bottles in creating a water container?

1. Is there any significant difference between plastic bottles and aluminum cans in terms of compressive strength?
2. Is there any significant difference between plastic bottles and aluminum cans in terms of tensile temperature?

Methodology

Research Design

The study is a quantitative research following a true experimental design; using a t-test to analyze data. The data will be analyzed through the use of a software program named jamovi.

Research Locale

The following study will be conducted in De La Salle Zobel Vermosa Campus, Imus, Cavite and in the Department of Science and Technology (DOST).

Data Collection

The compressive strength test will determine the maximum capability of the container when under high amounts of pressure. On the other hand, the tensile temperature test will be used to check the resistance of the container when experiencing high heat. Data will be carefully observed and collected by the group.

Quality of Measurements

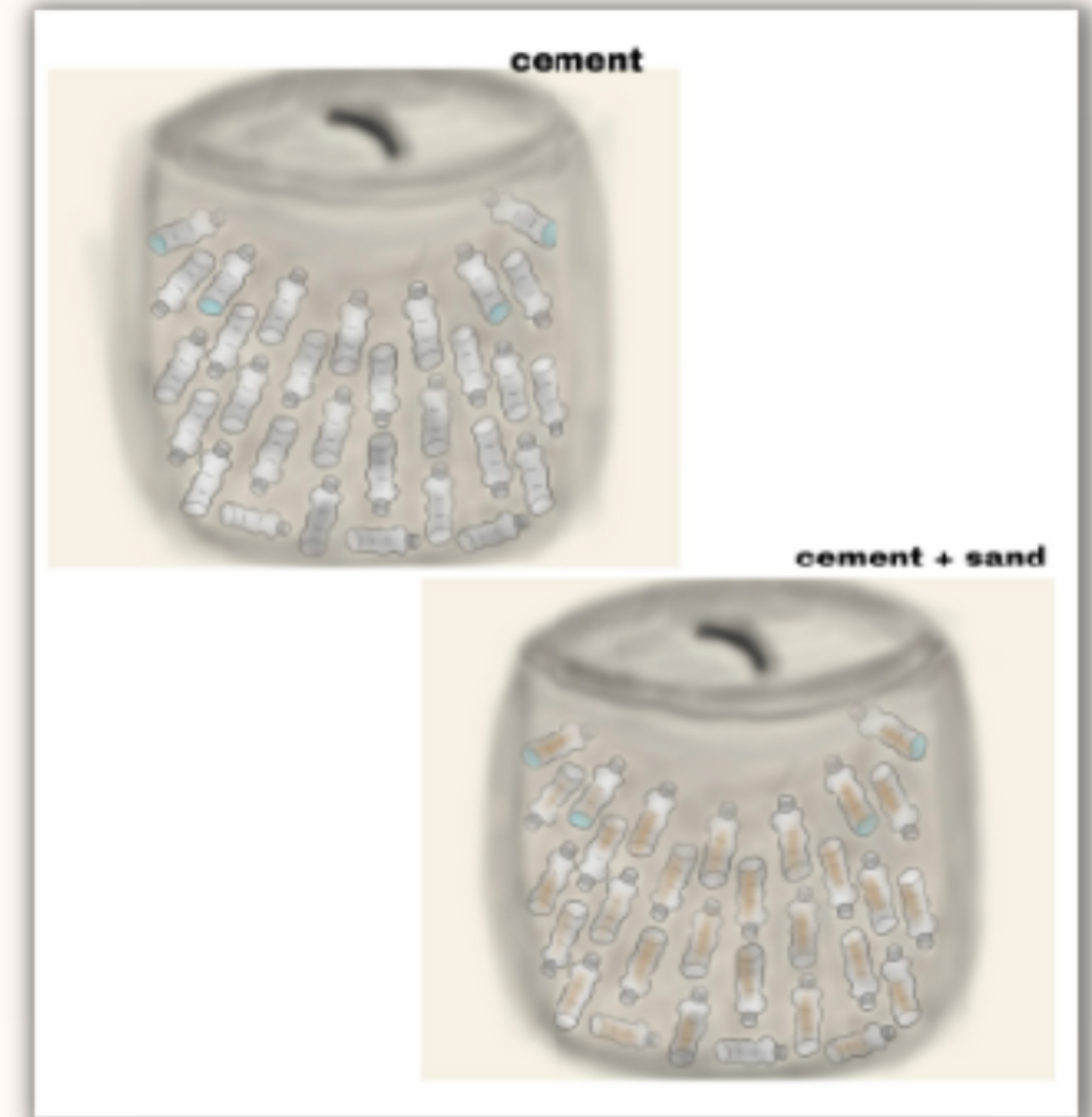
The group will use 120 molds (30 for each kind of container), all undergoing compressive strength and tensile temperature strength to record data on the structure and durability of the containers.

Instruments

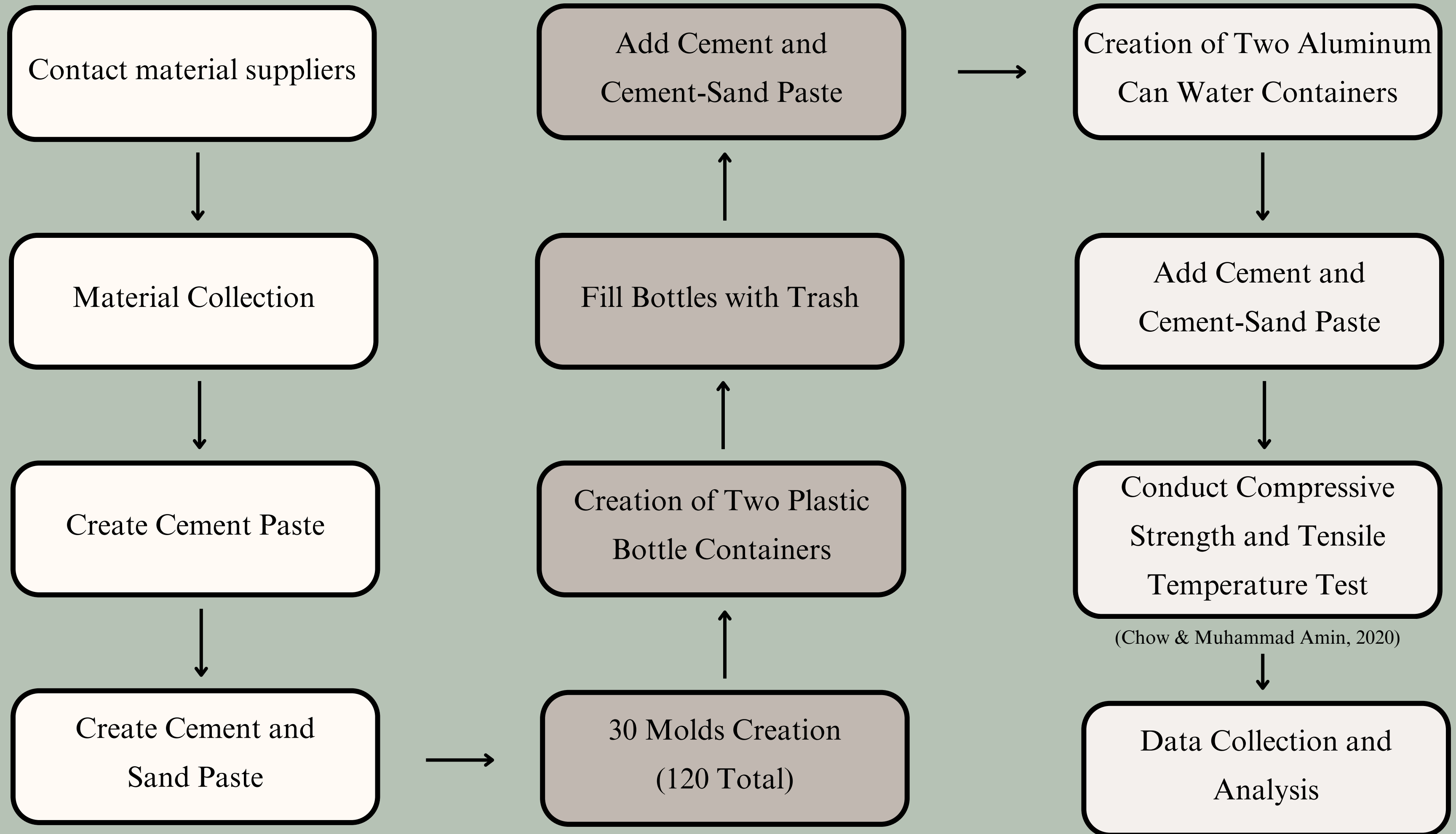


Compressive Strength Machine Tensile Temperature Machine

Model



Container made from packed plastic bottles and aluminum cans filled with cement or cement-sand mix



Data Diagnostics

If an abnormality is found in the gathered data, the group will infer what caused the abnormality, but it will be disregarded when presenting the data and discussing the results.

Analytic Strategy

A t-test will be used to determine which design of the two is the best and whether there are any significant differences between the two variables after conducting the tests.



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Thank You!