PRODUCTION OF ECO-FRIENDLY COMPOSITE TILES FOR BUILDING APPLICATIONS FROM RECYCLED PLASTIC WASTE

PRESENTATION TO

NATIONAL AGENCY FOR SCIENCE AND ENGINEERING INFRASTRUCTURE (NASENI)
GARKI, ABUJA

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INTRODUCTION

- Nigeria plastic waste crisis is driven by high consumption and low recycling rates
- Plastic waste leads to environmental and health problems
- Current recycling methods are limited by contamination and complexity of plastic types

Project objectives

- ✓ Develop durable, cost-effective tiles from plastic waste
- ✓ Reduce environmental impact of plastic waste
- ✓ Create a scalable, marketable product
- ✓ Promote circular economy principles

PROBLEMS WITH THE EXISTING BUILDING CONSTRUCTIONS TILES

- ❑ Traditional tile often relying on energy-intensive processes and non-renewable resources
- ☐ Cracking and chipping common with ceramic tiles if something heavy is dropped
- ❑ Glazed surfaces can wear down over time, becoming dull or slippery
- ☐ Ceramic tiles are expensive
- ☐ Ceramic and porcelain tiles are not easily recyclable.
- ☐ Most recycling methods often lower quality of recycled products

OPPORTUNITIES IN THE BUILDING CONSTRUCTION INDUSTRY

Problem We Are Addressing

- ✓ Reduce the volume of plastic waste pollution
- ✓ Decrease the demand for virgin materials in tile production

Our Innovative Solution

- ☐ Affordable building materials
- ☐ Create a new market for recycled materials and better waste management
- ❑ Boosts entrepreneurship and creates jobs

Market Analysis

- ❖ Potential applications (residential, commercial, industrial)
- ❖ Market size and growth projections
- ❖ Competitive landscape

Competitive Landscape

	Ceramic	Porcelain	Vinyl	Stone	Our solution
Raw materials availability	✓	✓	-	✓	✓
Eco-friendly	✓	✓	-	✓	✓
Durability	-	-	✓	✓	✓
Low energy production	-	-	✓	-	✓
Ease to recycle	-	-	-	-	✓
Affordability	-	-	-	-	✓

JOURNEY SO FAR

- We have developed composite tiles using only LDPE and sand reinforcement material
- We conducted structural integrity, durability and water absorption tests.

NEXT RESEARCH STEPS

- ☐ We are determined to develop our solution through a process that can utilize a wide range of plastic waste to produce a high-value end product
- ❑ Improve on the finished product and expand on products analysis including weather and chemical, fire and slip resistance, environmental and safety tests.
- ☐ Prototype development with a range of tiles varying in size, thickness, and design

TEAM MEMBERS

An evolving team of competent and committed members

Dr. Julius THADDEUS, PhD. Mech. Eng.
Research and Development Expert

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