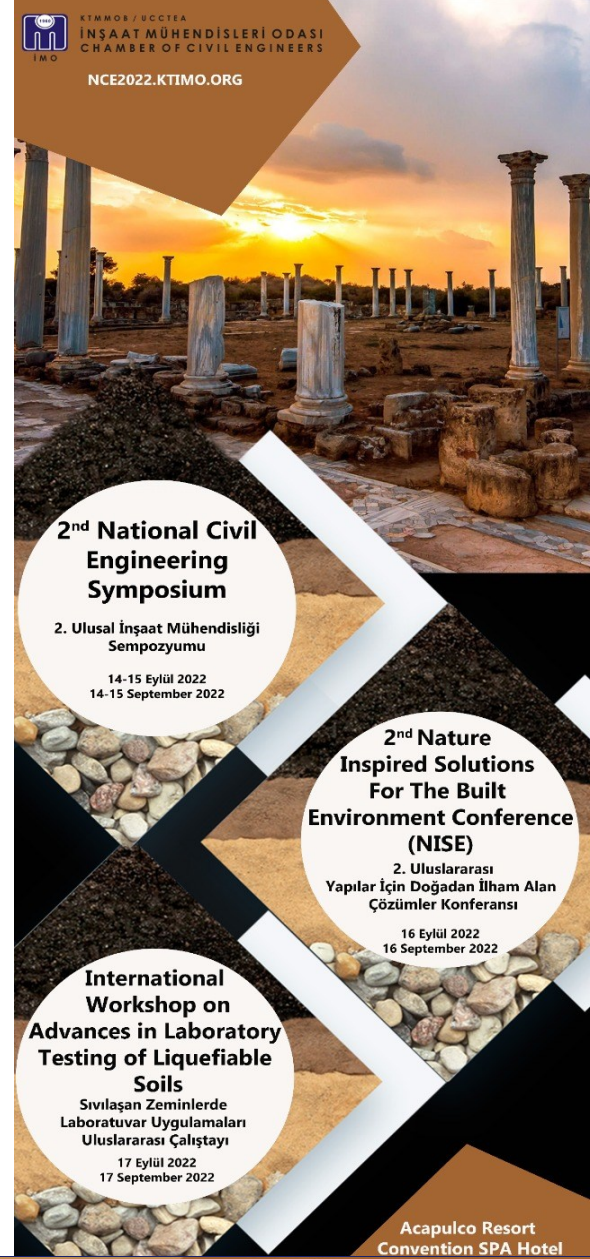


# INFLUENCE OF INTEGRATING RUBBERS WASTE ON EARTHEN CONSTRUCTION ADOBE PROPERTIES

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**2<sup>nd</sup> National Civil Engineering Symposium**  
2. Ulusal İnşaat Mühendisliği Sempozyumu  
14-15 Eylül 2022  
14-15 September 2022

**2<sup>nd</sup> Nature Inspired Solutions For The Built Environment Conference (NISE)**  
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Acapulco Resort Convention SPA Hotel



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14 -17 Eylül  
14 - 17 September 2022

# Presentation outline

- ✓ Introduction
- ✓ Literature Review
- ✓ Materials and methods
- ✓ Preliminary Test Result
- ✓ Conclusion

# Introduction

- sustainable development
- Alker
- Sand, Clay, Gypsum and Lime





# problem statement

- rigid materials
- mechanical and dynamic properties of Alker
- minimizing the negative environmental impact of rubber tire
- No extra treatment or chemical alteration.



# literature Review

- Current studies regarding the earthen construction adobe investigated the influence of incorporating polypropylene fiber, straw and plastic fiber with minimal percentages as the case for [Binici et al. \(2005\)](#), [Donkor Obonyo \(2015\)](#) and [Ahmad et al. \(2021\)](#).
- On the other hand, [Pekrioglu Balkis \(2017\)](#) was the first to include waste in the production of earthen construction where she used waste marble dust and found that it enhances the strength significantly when 10% is added to the mixture.

# Materials and methods

- Used soils





- **Used additives**



Calcium Sulphate Hemihydrate ( $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ )



calcium hydroxide ( $\text{Ca}(\text{OH})_2$ )

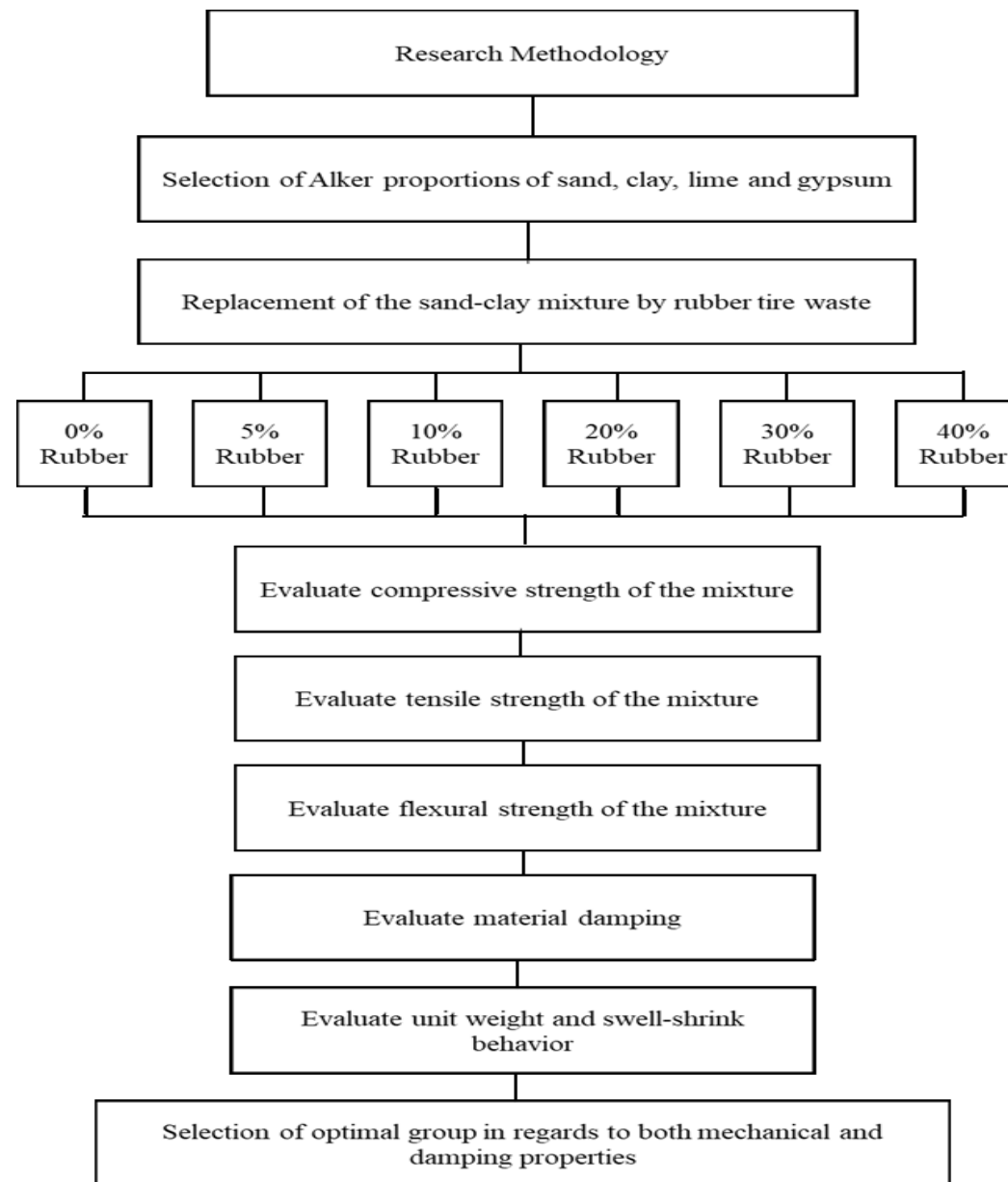


Rubber Fibers



Fine size of Waste Tires

- Research program





- **Rubber waste fibers**

l/d Ratio

Scanning Electron Microscopy

Chemical Composition

- **Economical analysis**

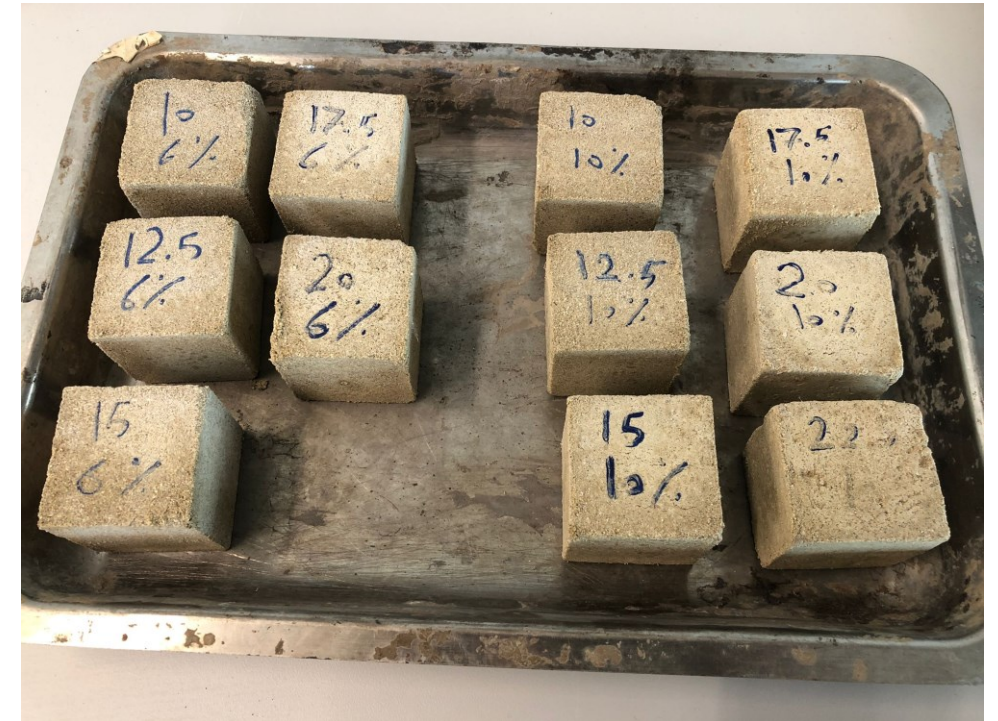
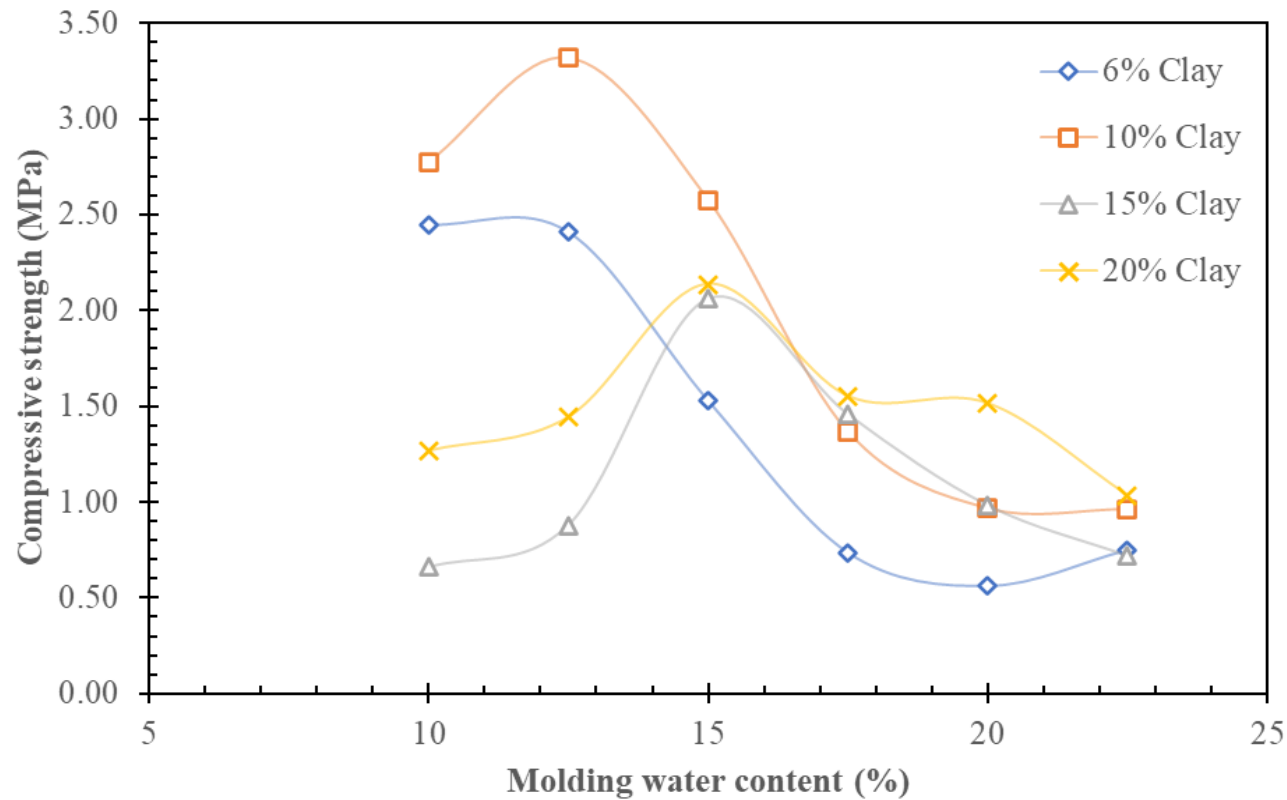
Feasibility Investigation

Cost Comparison

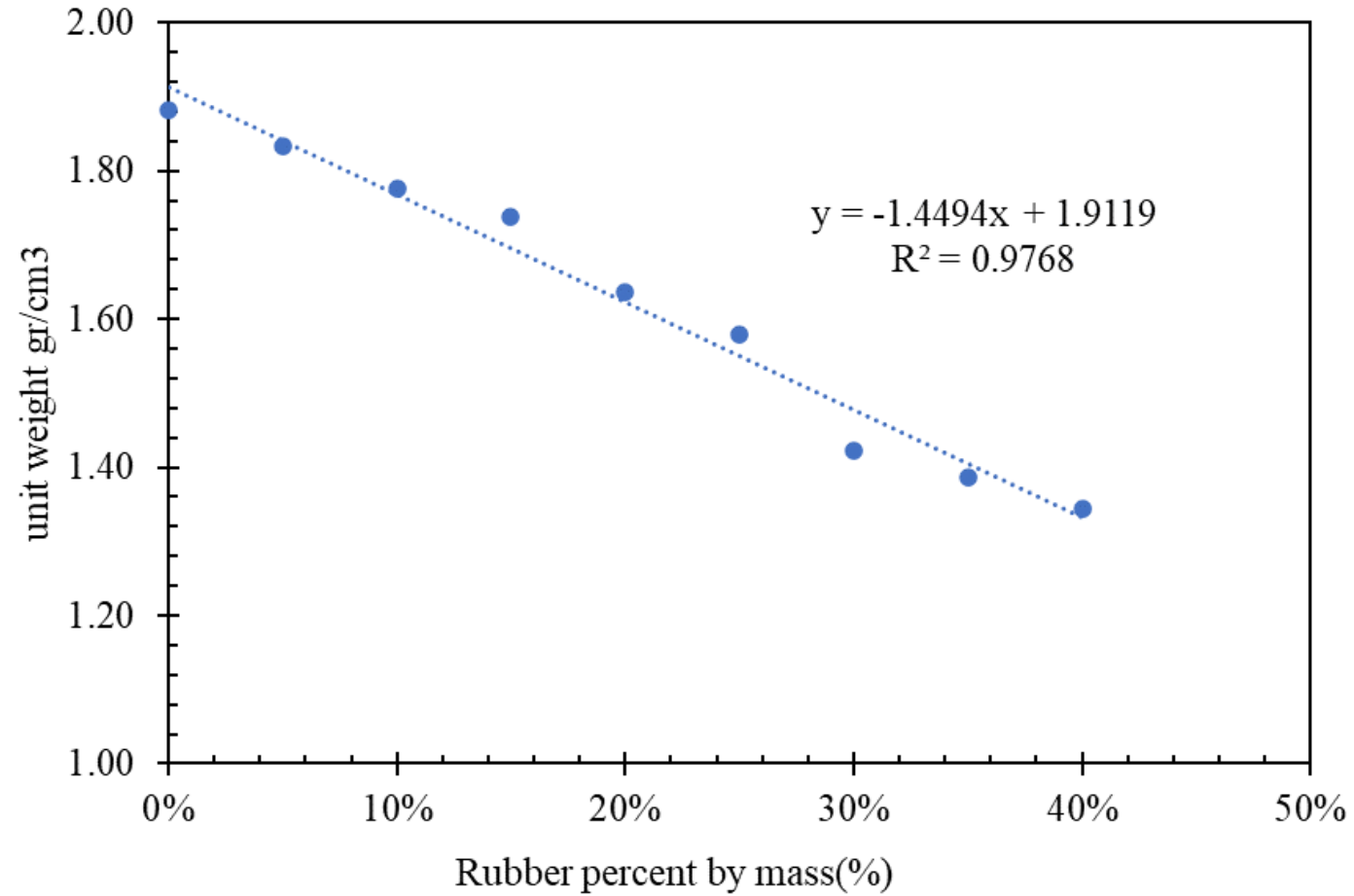


# Preliminary Test Result

- Molding water and clay content

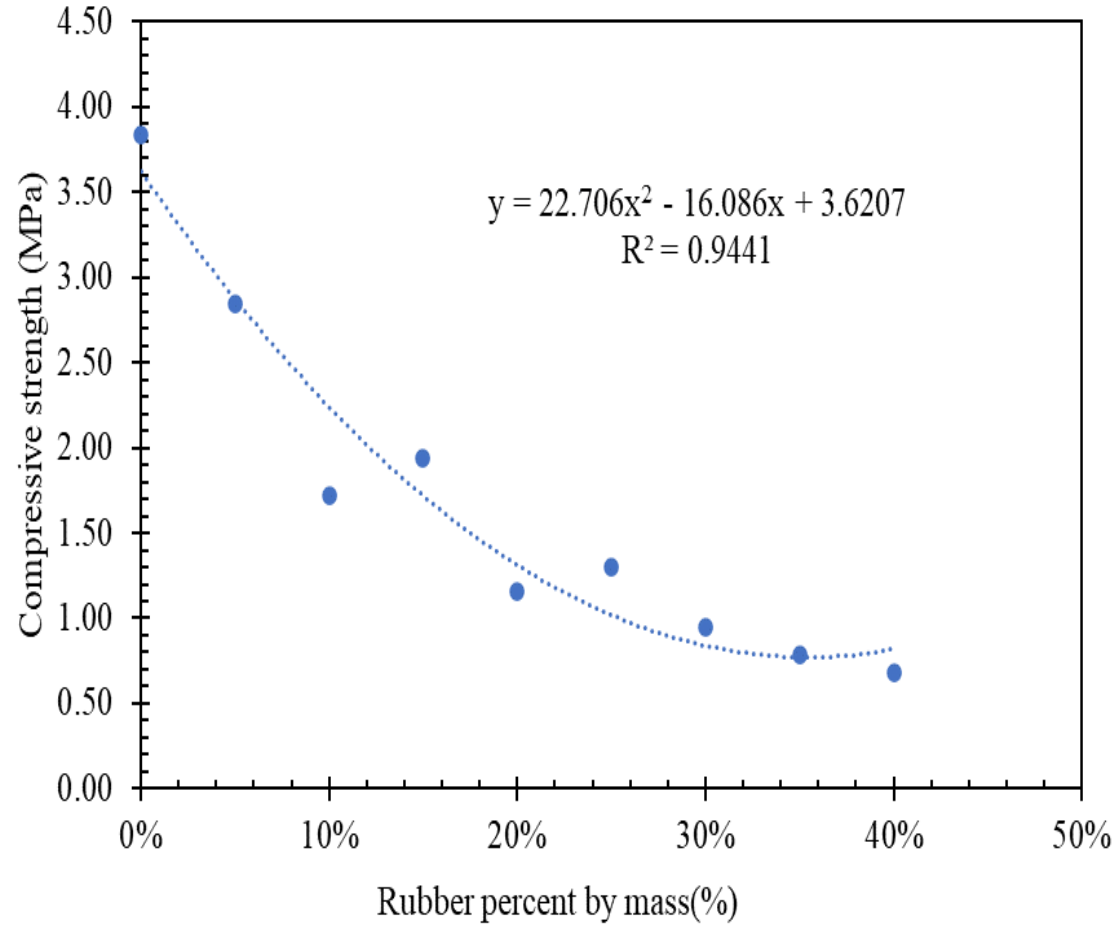


- Unit weight





- Compressive strength



# Conclusion

- This presentation addressed a new sustainable construction material to be used in regions with high seismic activity.
- This will be achieved by incorporating shredded tire rubber wastes into earthen construction materials to produce light weight material with energy dissipation properties.
- In order to achieve this objective, a testing program is proposed to investigate the optimal proportions of the mixtures.



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# THANK YOU FOR YOUR ATTENTION



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