



**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

**FACULTY OF ENGINEERING**

**DEPARTMENT OF MINING AND WATER RESOURCES ENGINEERING**

**FINAL YEAR PROJECT REPORT**

**A SOLAR POWERED INTERLOCKING STABILIZED SOIL BRICK MAKING  
MACHINE**

**BY**

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*A final year project Report submitted in partial fulfillment of the requirements for the award of a  
Bachelor of Science degree in water resources engineering of Busitema University*

## **ABSTRACT**

Brick/block is a very important material in the construction industry, a brick is required for every construction activity bit shelter & housing, hydraulic structures (for example in the masonry dam construction) and in so many other fields. The production of good quality, most efficient, and affordable bricks is paramount to solve housing problems in developing countries like Uganda (Premkumar et al., 2020). This is still seemingly hard to obtain due to the high cost of brick production in developing countries. Fortunately, many naturally occurring substances, such as clay, sand, wood, and rocks are over 90% available in these rural areas and can be employed to cut down costs on materials. However, the cost of sophisticated modern brick Moulding machines ranges between \$2,500 and \$3,000 (Mogaji, 2011) and there daily operation cost is generally high due to the use of electricity (costly units 1500ugx) or fuels to run the machine motors. While there are cheaper manually operated machine options on the market, these are very laborious and hectic to use. Thus, the solar powered Compressed Earth Brick (CEB) making machine employs solar energy to hydraulically compress the soil mixture. This machine overcomes the laborious effort and low productivity of manually compressed earth bricks. This also technology mitigates the challenge of environment pollution caused by fired brick kilns. The constructed compressive earth brick (CEB) making machine can produce on average a total of 240 bricks per day (8 hours). The cost of production of the machine was 2.08 million UGX only. Whereas, the most common hightech motorized CEB machine in Nigeria (Hydra form®) with an average capacity of about 3,000 bricks per day costs about six million shillings(Yakubu & Umar, 2015). Thus this machine is relatively cheaper for small scale enterprises.

**DECLARATION**

I **OCHAGO JOHN** declare that this final year project report is a result of my own efforts and tremendous work done during the research period and it has never been submitted to Busitema University or any other institution of higher learning for any academic award.

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**APPROVAL**

This is to certify that this project report was written under the guidance of my supervisor on the topic *“Design and construction of a solar powered interlocking stabilized soil making machine”* and is now ready for submission to the department of Water Resource and Mining Engineering, Busitema University.

**NAME OF SUPERVISOR: MR MASERUKA BENDICTO**

**SIGNATURE: .....**

**DATE: .....**

## **DEDICATION**

I dedicate this report to my parents, my family, friends and my lecturers in Busitema University.

## **ACKNOWLEDGEMENT**

I would like to extend my sincere thanks to the almighty GOD who has gifted me with life and has enabled me to reach this academic height as he has been the provider of all the necessary requirements.

Great thanks to my beloved parents Mr. James Paul Oluka and Mrs. Jane Frances Asumo for their financial and moral support throughout my life.

Let me convey my heartfelt appreciation to my supervisor, Mr. Maseruka Bendicto for his advice as well as guidance during the preparation of this report.

Not forgetting my classmates

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## **LIST OF ACRONYMS**

PV photo voltaic

AST apparent solar time

MDOD maximum depth of discharge

CEB – compressed earth brick

ISSB-interlocking stabilized soil bricks

NPV- net present value