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**PRE-FEASIBILITY STUDY  
ON THE USE OF RICE HUSK ASH  
AS CEMENTITIOUS BINDER IN KENYA**

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by

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**University of Nairobi  
HOUSING RESEARCH AND  
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## 1.0 INTRODUCTION

One of the main fields of action of the Housing Research and Development Unit (HRDU) of the University of Nairobi, is the research, development and dissemination of cost effective building materials for housing in Kenya. After having concentrated mainly on walling (especially stabilized soil blocks) and roofing materials (especially fibre concrete roofing tiles), the HRDU is currently starting up a research component concerning binders.

The reason behind this is quite evident. Knowing that for a typical conventional low income housing unit, the part of walling costs varies between 30% and 35%, and the part of roofing costs can easily take between 15% and 20%, we can see that between 45% and 55% of the total dwelling cost are already covered by walling and roofing. The next important building elements in terms of building costs, are the foundations and the floors (Ref. 39).

However, the binder is the most costly building material, occurring in walls (blocks, mortar and plaster), roofs (if cement tiles are used), floors (concrete floor or stabilized floor) and foundations. Cement, which is the most widespread binder in Kenya, is sometimes unnecessarily used for applications where other binders could easily perform the necessary requirements. Starting from the current housing situation in Kenya, a cheaper solution for cement would be one of the most cost-effective modifications which could be imagined in terms of building materials.

Of course, the importance of a new binder largely depends on the availability and variety of existing binders in a region, the relative costs of these binders, and the prevailing building practice in a certain context. In several countries, the development of cheaper binders has already received considerable attention from research institutes and private entrepreneurs. Different paths have been followed, but the main direction has been the (re-)introduction of lime and pozzolanic materials, in order to reduce the cost of binders while ensuring the same or better quality of the end-product. Within the field of pozzolanic binders, the largest experience has been gathered from experiments with blended cements and lime-pozzolana binders.

Both natural and artificial pozzolana have been tried out. Within the natural pozzolana, volcanic ash, tuffs and scoria are the best known. Artificial pozzolana include fly ash, burnt brick dust and vegetable ashes, among others rice husk ash (RHA). The present report is mainly concentrating on the feasibility of producing binders based on RHA in Kenya.

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