

MFA-62



UNIVERSITY OF NAIROBI  
HOUSING RESEARCH AND DEVELOPMENT UNIT

LOW COST PAPYRUS-POLYTHENE ROOF

The performance of an experimental roof  
of papyrus sandwiched with polythene sheet.

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## 1.0. INTRODUCTION

As part of the efforts to arrive at alternative solutions for roofing at lower cost, an experiment of a modified papyrus roof was carried out. Polythene sheets of three different thicknesses were placed between two layers of papyrus mats. This experiment was initiated by Mr. J. Eygelaar, materials engineer of the HRDU, in 1977. Though in certain rural areas in Kenya, papyrus is used as a roofing material, transportation of big quantities is very costly, which in turn reduces the amount available for roofing. Polythene for water tightness was thought to be a good replacement, due to the limited availability of papyrus. An experimental roof was erected on a terrace of the building of the Faculty of Architecture, Design and Development of the University of Nairobi. (See Photograph 1 below).



Photograph 1. Overall view of the experimental roof structure.

The purpose of this experiment was (i) to check the durability of papyrus against rot, fungi and tear, (ii) to check the durability of black polythene sheeting against ultra violet radiation, heat, rot and (iii) to check the combination of both materials. This study only deals with the technical aspects of these materials. Acceptability of this type of roof in rural areas where papyrus is largely used, has not been investigated. Papyrus is also used for sleeping mats in the rural areas.



Photograph 2. Detailed picture of the method of sandwiching the polythene and papyrus mats. View of innerside.

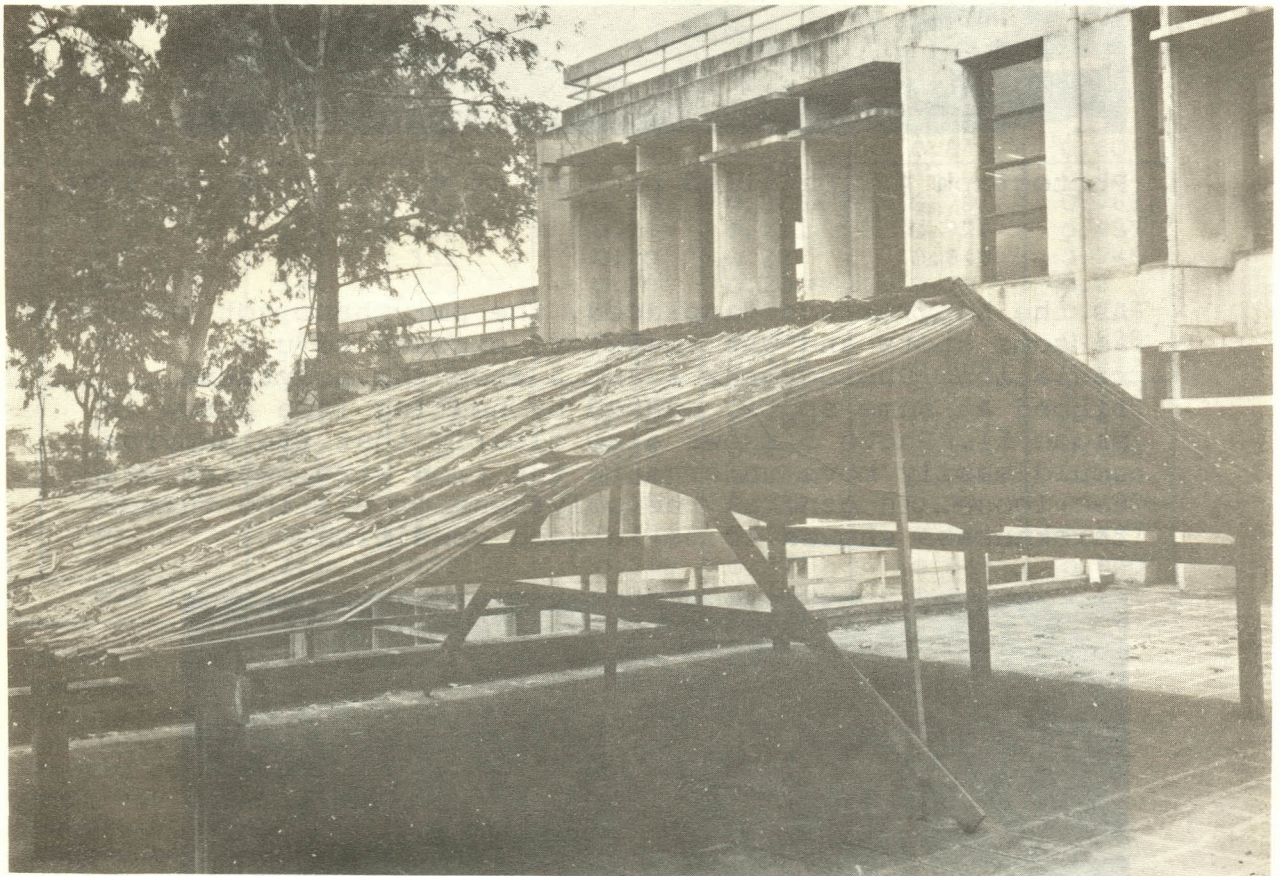
#### 4.0. ANALYSIS OF THE DATA

##### (i) The roof

During at least three years the experimental structure has been subjected to Nairobi conditions at a height of 1500 m above sea level. These conditions are:

- a. Rain : causing humidity differences, rot
- b. Sun : causing temperature differences, rot; u.v. radiation, wear and tear.
- c. Wind : causing mechanical stresses, wear and tear
- d. Insects/fungi : causing rot, wear and tear.

The photographs in this chapter were taken after three years and show a number of the effects mentioned above.



Photograph 3. View of the top side of the experimental roof.

The roof shows a lot of leaves on top, being dropped from the surrounding trees. Photo 3 shows also that the papyrus has been displaced in due course due to improper fixing methods. The photograph on the next page will show this in more detail.