

SUSTAINABLE HOUSING UTILIZING INDIGENOUS MATERIALS IN THE MARSHES

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ABSTRACT

Low cost housing is always thought to be an affordable non-sustainable housing for rural areas and is not part of urban planning. It would be a challenge to develop and plan a complete, sustainable, and affordable housing scheme for rural areas which utilises local indigenous materials. This needs the introduction of carefully-targeted interventions to improve the lives of people in the marshes through affordable and durable building stock, drinking water, health care, and employment opportunities. In some areas of these marshes there is a tendency for a modern lifestyle similar to that of an urban population. Such areas are losing individuality and a real need for preservation is deemed necessary. The environmental and socio-economic factors could create a rural settlement fabric pattern that would be unique in the world. This paper will present the planning and implementation of a housing complex in the marshlands of Iraq. The paper will also touch on a full-scale trial embankment constructed in an experimental station in the marshes that utilized bundles of reeds as reinforcement.

Keywords: Sustainable Housing, Developing Country, Indigenous Material of Construction

1. INTRODUCTION

The marshes in Iraq cover an area of 4000km² during drought time and 15000km² during flood time. The altitude varies between 1m below mean sea level to 4m above mean sea level. The area is strongly characterized by marshes and marshland (Maxwell, 1998). The soil in the marshes was formed during the Pleistocene time. It is fully covered by recent quaternary river alluviums. Marshland soil is characterized by continuous water presence, near or above the land surface which creates particular conditions for lacustrine life. The

water level in the marshes varies from 50cm to 400cm which may increase somewhat during exceptional flood. The climate in the area is of a sub-tropical type, hot and dry in summer; cool with little rainfall in winter. Dominant winds are northwesterly. The mean air temperature ranges from about 12°C in January to about 37°C in July, and the mean relative humidity in the same period ranges from 78% to 49%.

The main types of plants are palm trees, cane (*Phragmites karka* Trin.) and papyrus (*Typha latifolia*) which grow on the edge of marshes between 0.5 and 2.5 m of water level. These plants have been used as building materials since the past and the techniques of material processing and building have been gradually improving till the present day. Reed houses are the most peculiar features of the marshes. Such houses are built on small artificial islands made out of layers of papyrus and mud. The utilization of reeds and mud houses of all forms has reached an excellent level by traditional standard as reeds are natural (need no treatment) and almost manually transformed without any external tool (Salim, 1970).

This technique confirms the variety and richness of inventions by local builders who made the best possible use of simple and locally available building materials. They also satisfactorily meet the needs arising from various regional and environmental conditions. This environment is characterized by a close relationship with nature ever since the earliest forms of civilization. The rural population has maintained the local characteristics of their homeland settlement and it becomes a rational and emotional necessity (Samarai and Azawi, 1997).

The adoption of imported sophisticated building technology contributes to high energy consumption, expensive maintenance and counteracts the move for the use of lower-cost housing technologies to raise the living standards of the low income population in developing countries. Local authorities and standards do not encourage the use of indigenous materials. What is indigenous

