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CLIMATIC ASPECTS OF DESIGN, MATERIAL SELECTION,
AND CONSTRUCTION METHODS OF RURAL HOUSING

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CLIMATIC ASPECTS OF DESIGN, MATERIAL SELECTION,
AND CONSTRUCTION METHODS OF RURAL HOUSING

1. Traditional rural housing

The layout, construction methods, and material choice of traditional rural houses are governed by the following factors:

- a. living patterns and family structures,
- b. economic aspects,
- c. climatic aspects,
- d. available materials
- e. available skills.

The first two factors are related and could be grouped together under the combined headings: socio-economic aspects:

This paper will concentrate on the latter three aspects (c, d, and e), and the socio-economic aspects are only mentioned shortly to complete the picture.

- a. Living pattern and family structure have led to certain "standardised" house shapes and sizes, and have influenced the arrangement of the various buildings in the compound (homestead) which houses the family and its livestock.
- b. Economic aspects (in simpler words: the way to earn a living) have influenced certain "planning aspects" of rural housing, mainly the location of the homestead: choice of the location to be on or near the agricultural growing areas (for agricultural communities) or the pasture area (for agricultural cattle breeding communities).

Durability of the structures was often linked to agricultural methods when these involved working of the land for a number of years and moving to freshly opened-up land afterwards.

This demand for less durability applies even stronger for groups of people with pastoral activities leading to a semi-nomadic or fully nomadic life. In extreme cases this has led to house shapes and construction methods allowing dismantling of the house in a few hours, transport animals of burden, and re-erection at the new location within the first hours after

(Whether the nomadic way of life should be regarded under living patterns or as an economic aspect is immaterial here, because neither of these aspects will be discussed in detail in this paper).

- c. Climatic conditions have influence on the design and construction methods of rural houses, which is quite obvious when comparing houses in regions with extreme climatic differences. Dry desert areas show houses built with heavy walls and similar flat roofs, with small ventilation openings, and built around well shaded courtyards. In hot humid areas walls are light, ventilation openings ample, pitched roofs cater for heavy rainfall, and large roof overhangs create well-ventilated shaded areas and protect the walls from rain.
- Where climatic differences are less pronounced, the pattern is less recognisable, especially when regarding individual structures within the compound (homestead) which, for instance, often show small ventilation openings where the climate demands ample ventilation. It should be stressed here that the whole homestead should be regarded as the house, with the open spaces of the compound forming circulation and activity spaces just as much as the individual structures which enclose other "rooms".
- Another aspect of climate is its influence on the availability of materials and their behaviour and durability.
- d. Available materials were in the past limited to natural materials available near the homestead. This has led to extensive use of stone and dried earth in desert areas, both for walls and roof construction with limited use of palmtrunks and -leafs as support members. More humid areas with lush vegetation show extensive use of vegetal materials, like walls of timber poles and branches covered with, or filled-in with, earth or clay, timber or bamboo support structures for the roof which is covered with thatching in grass, reed or palm-leaf.

Availability of some materials is linked to the "way to earn a living"; pastoral activities, for example, may lead to the use of animal dung for waterproofing of walls and roofs.

Where good clays are available and firewood is plentiful traditional manufacturing of burnt-clay bricks has developed in certain regions, although the use of bricks for rural houses is far less than could have been expected.

Obviously there exists a direct link between the climate and the availability of natural materials, although sometimes traditional building methods outlive the ready availability of certain materials when either the climate changes (gradually) or when the population moves to other areas.

- e. Available traditional skills have led to differences in rural houses in adjoining areas where both climatic conditions and availability of materials are hardly different.

On the other hand, skills are related to the available materials and are often based on the structural properties of the materials. Availability of long tough tree branches has led to arched roof support members dispensing with central poles (for conical roofs), whereas where such materials are not available this skill has not developed.

Due to the fact that skills have developed over several generations they lead in general to optimal use of materials which again influences certain limiting dimensions (span of roof, and thus size of rooms).

2. Changes in rural housing

The above paragraphs describe rural housing as it has developed in the past. It cannot be denied (although it may be regretted) that such housing in its pure form is now rapidly changing as a consequence of changing conditions. Following the same reasoning as before, the previous factors can be considered: