

INTRODUCTION

The context in which adobe and other forms of sun-dried earth is traditionally used in buildings, is presented in this paper with particular reference to two countries - Ghana in West Africa and Pakistan in the South Asian Sub-continent.

The general context is established in terms of the physical characteristics of earth and the social, economic and material factors which influence the choice of this material and the forms in which it is used for building. These are illustrated by examples of traditional uses, mainly in a rural context, in Ghana and Pakistan. A few examples from both countries, of the introduction of new forms and techniques, are included to raise some of the issues related to the context of cultural change. But the questions of 'acceptability' are not analysed here in any detail as they belong more to the discussion on problems of programme implementation and future directions in the use of adobe in building.

GENERAL CONTEXT

The chief advantage of earth as a building material is its low cost. Indeed wherever it is available it usually costs nothing more than the labour required for its preparation and placement. A second advantage is the low level of skill & technology required for its use in construction. Earth construction often requires no more tools than a spade and a bucket. Similarly the cost of repair and maintenance of earth structures is nominal and does not usually require the employment of specialist skills. However, its permeability to water makes it an impermanent material in wet climates. Furthermore, its permeability to pests and its structural weakness impose certain limitations upon its use in building.

As will be evident from these characteristics, the choice of earth as a building material will normally be determined essentially by its availability and considerations of costs, compared with other alternatives, and of available technology and skills. After air and water, earth is of course the most abundant of materials, and wherever it is available at site it is practically free. But in many situations, for instance along sandy coastal and rocky or wooded mountainous areas, or indeed in built-up urban centres, it may be either not available or may be available at some distance from the site. In such situations timber or other available vegetation (bamboo grasses, reeds, palm fronds etc.) or stone, or even throw-away industrial products like packing material, (plywood, plastics, boards & sheets) and abandoned or unused existing buildings, may provide a more attractive source of building material.

In any case where it is available, it will normally be used for building if cost represents an important constraint, or where considerations of cost out-weigh the disadvantages of water and pest penetration and impermanence.

An important determinant in the choice of earth is also the level of skills and available technology, especially in situations where cost constraints are critical. Labour, skills and technology which the builder himself does not possess have to be paid for in cash or kind. In subsistence economies, or in societies where labour and goods are exchange by barter, traditional skills and labour can usually be acquired without any cash outlay. But industrial products or skills on the other hand often become inaccessible not only for lack of effective communications and distribution or marketing but also because they must be bought with cash.

Another factor determining the choice of earth is time. That is, the expected or desired life of a building. The life of earth buildings, especially under wet conditions, is relatively short. However not every building needs to be designed for a long life. Conditions of high mobility (as in the case of semi-nomads, rural & urban migrant labour), or insecure proprietorship of land often require a temporary structure which can be put up with little or no money and can thus be abandoned if necessary without much loss of invested capital. Alternatively buildings which could be conveniently modified in time - added to or changed - also have a distinct advantage in many circumstances.

In dry climates of course earth structures are known to have lives of a hundred years or more. Under these circumstances even buildings normally associated with long lives such as forts, mosques, palaces etc., may be made of earth. Besides, the thermal properties of earth (high thermal capacity) can be a valuable assets in extreme climates, particularly in hot-dry desert climates, where it is often used in massively proportioned structures which provide evenly comfortable interior environments in climates with high diurnal ranges of temperature. In warm-humid climates however with low diurnal ranges, structures with low thermal capacity are more desirable. In these climates lighter materials such as bamboo, reeds, etc., or composites such as earth plaster on timber lath & frames, are preferred over massive earth.

The forms of earth buildings are naturally determined to a large extent by physical factors such as the properties of available materials, and the requirements of each climate. But equally decisive is the level of social evolution or development and social structure. This last determines both the availability of resources (monetary, technical and intellectual) available to a community and the functional types of buildings required by it. Modes of production, social and property relationships, political structure and ideology are strong cultural factors which make up the context for earth buildings.

A thoroughly industrialized society, employing capitalist modes of production in industry and agriculture generates both the surplus value and the need for an expanding consumer market. This environment is not compatible with a subsistence economy and with social activities which place no demand on the products of its industries.

Such societies can not only afford better than simple mud houses, they can not afford 'no-cost' buildings. Besides, even on purely technical grounds, traditional earth technology can seldom provide the performance required of most functional categories of buildings in an industrialize society.

Adobe or earth, as it is traditionally used in buildings, has little relevance in this context of thoroughly industrialized consumer societies, except as the playthings of rich accents or as a potential area of expansion of the consumer market.

Self-help, no-cost building, with freely available materials and techniques, requiring no imported skills, are indeed only relevant in the context of under-development or uneven development. It is normally only situations of uniform distribution of poverty or of unequal distribution of wealth which provide the cultural contexts for earth buildings. Even within such situations, in drier climates earth becomes more universally used by all sections of a community and as a primary material for all types of uses, and in all climates it is more frequently used in a rural rather than an urban context.

In a rural context the annual cycle of activities related to agriculture includes periods of relative unemployment in which labour can be utilized for the construction or repair of buildings. This coupled with a near subsistence economy in which cash is scarce, free availability of earth and often insecure or temporary tenure in many rural societies makes for conditions in which the use of earth for buildings becomes more general.

In the market economy of urban societies, however, any period of unemployment is catastrophic and must be utilised in search of employment. In addition, urbanisation, by its very nature, usually closes up the sources of freely available soil, except at the fringes of urban development. Nevertheless, inspite of the unfavourable context, earth buildings in urban areas are not uncommon, particularly in very dry climates or as a reflection of extreme poverty and insecurity.

The examples which follow show the variety of forms and techniques evolved for building in two countries: Ghana and Pakistan. These examples show that where the determinants remain constant for long periods or change very slowly, appropriate forms and techniques are evolved within the context of an indiginous culture. When the determinants are modified, by the introduction of new resources, materials, skills, techniques, or design concepts and cultural values etc., the indiginous builder and craftsman often responds in ways which are different from those of a 'professional designer'.