Sustainable architecture: a process for achieving shelter that will keep going

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Whilst one could be forgiven for considering that sustainable architecture means buildings that will survive and function for a long time, the real concern is the search for and the encouragement of methods and materials to achieve safe and durable shelter and settlements that people can go on using with the skills and resources available to them. This is an elusive target.

The global and local context in which we live is evolving more rapidly than ever. Local approaches to achieving shelter that have been sustainable over many centuries are now in too often ceasing to cope with today's needs or relate adequately to today's available resources. In this environment, new solutions and approaches that seem genuinely sustainable are hard to find. Where they exist, they need to be encouraged if we are to keep pace with rapidly growing needs.

Declining sustainability in traditional solutions

Many examples of traditional planning and building methods were indeed good examples of sustainable architecture in their time, and represented good uses of local resources matched to local skills which combined produced a built environment which met people's needs. The increased interest in indigenous building methods over the past thirty years reflects the widening appreciation that there are many lessons to be learnt that can contribute to meeting contemporary and future building and planning needs, witnessed by major works such as the Encyclopaedia of Vernacular Architecture of the World[1].

But factors including demographic growth, shifts from rural to urban areas, natural and man made resource depletion, and significant changes in expectations and life styles, all combine in their various ways to erode the viability of traditional or even recent approaches to shelter provision.

This means that with many traditional approaches to solving housing needs, whilst there are aspects that still work well, some aspects may have become inefficient or unworkable, or in general, un-sustainable: the local resources are no longer available; the concentration of people requires a different sort of building or simply more buildings more quickly, the source of finance has changed or is perhaps insufficient for the way in which one now needs to acquire materials or labour.

Taken together, all these changes means that a building method that worked well in the past in its given context may have now become difficult to afford, to build and to maintain, and it may no longer meet the desired requirements of the family. Gradually it becomes clear that an alternative has to be found. Moving into cities, or living in rapidly expanding cities exacerbates this scenario, and creates even bigger pressures to search for the ways that people can build today with the resources available.

But many approaches to shelter provision developed over the past 50 years require equipment or skills or capital that under normal circumstances go beyond what can be accessed by the majority. Policy and perceptions tend to reinforce the gap between building methods and materials deemed "acceptable" in a formal construction context, and those which are deemed temporary or inferior, unable to do more than provide a very short term and probably unpalatable answer to growing shelter needs.

[1] Ed. Paul Oliver, *Encyclopaedia of Vernacular Architecture of the World*, Cambridge University Press, 1997.

Between the declining viability of traditional solutions and the inaccessibility of many modern alternatives, sustainable architecture defines an approach that seeks to bridge this gap.

Sustainable architecture means a process that can be repeated

Sustainability is a concept increasingly used as a measure of the *worth* of an approach to meeting contemporary shelter needs both in a durable and repeatable manner. Sustainable architecture implies an approach that in a development context goes durably beyond the product. There is thus a focus on the process as well as the end product. Sustainable architecture certainly recognises that the end product may wear out over time and need to be replaced , but it also recognises the *process* remains viable, and is one that can be renewed or repeated without undue damage to resources and the environment, not with undue need to resort to major external inputs.

Therefore sustainability implies shelter solutions that can go on being achieved with the mechanisms and skills that are or have been put in place and with the resources that can go on being used.

In this view, sustainable architecture brings together at least five key characteristics:

- environmental sustainability – does the approach avoid depleting natural resources bases and avoids contaminating the environment?
- technical sustainability - can the skills be introduced and passed on to others, and are the tools needed accessible?
- financial sustainability – can money or service exchange be accessed to pay for the work that needs to be done?
- organisational sustainability – is there a structure of sorts that allows one to bring together the different needed participants, without, for example, needing to call on outside expertise on each occasion?
- social sustainability – do the overall process and the product fit within and satisfy needs in the society?

In practice there will almost always be an slight compromise between one or other of these characteristics, in as much as one aspect may only be achieved to the slight detriment of one of the others: financial sustainability may only in reality apply to a certain socio-economic group, such as is often the case of housing loans; there might be a slight compromise on environmental sustainability if this was compensated by financial sustainability and accessibility. But the goal is to achieve an equitable balance between all the criteria, taking account of the local context.

Sustainable architecture takes time to put in place

A ‘sustainable architecture’ package cannot be transferred as a ready-made product form one place to another. In searching for sustainable architectural approaches we can see that an overall idea may appear to satisfy the characteristics listed above, but in practice many of these characteristics can only be considered sustainable in a given context. Identifying what will really be sustainable takes time, to train and develop skills, to demonstrate an idea, or to put in place an organisational or financial system that can become sustainable, and to test that all this works.

Such has been the case with the "Woodless Construction" Programme in West Africa[2], where the construction of vault and dome roofed buildings using simple, hand made unstabilised mud bricks has been gradually introduced by Development Workshop[3] over the past 20 years to Niger, Mali, Burkina

[2] See : John Norton, *Woodless Construction – unstabilised earth brick vault and dome roofing without formwork*, Building Issues, 1997, vol. 9, n° 2, published by LCHS, the Lund Centre for Habitat Studies of the School of Architecture of Lund University, in collaboration with Sida, the Swedish International Development Cooperation Agency.

[3] In collaboration with several country-specific partner organisations including the World Conservation Union (IUCN); the World Wide Fund for Nature (WWF); the Danish, Malian and Burkina Red Cross Societies; SOS Sahel; ILO; Lutheran World Relief; European Development Funds; and US Peace Corps.

Faso, and Mauritania as a response to the declining availability of organic resources used in construction. Over the years, through training and demonstration, skills that have been developed to the point where technical and organisational sustainability can be achieved and where local builders use the "Woodless Construction" techniques and their acquired skills to build for their own local clients using local resources.

The same applies to the example of the Grameen Bank housing loans programme in Bangladesh, where the capacity to provide and to repay housing loans has had to be developed over years – the bank began income generation loans to the rural poor in 1976 and housing loans begun in 1984. Today one can reasonably accept that over time a banking and loan system has been developed that can continue to function and go on providing loans that are efficiently paid back.

In both instances, reaching the point where one crosses the threshold of sustainability will actually have taken many years developing the system or the local skills and capacity.

Sustainable architecture is context specific

We have seen that the sustainable architecture approach brings together several characteristics, but that each one, environmental sustainability, socio-economic sustainability, etc. are essentially context specific, and relate to the resources that are locally available, or to the customs and needs of the local population.

Thus one cannot in reality classify a particular building technology as being "a sustainable architecture technology" nor, as if often mistakenly the case, can it be labelled as an 'appropriate technology". One cannot moreover assume that a credit system that works well in one place will work well in the next, since cultural, social and physical factors may make an system that works well elsewhere unworkable in a a new context. Thus, we can only assess the potential of a particular process or material to make a valid contribution towards a sustainable architecture *in a given locality*. Sustainability is context specific.

When considering what techniques and approaches may potentially produce popularly accessible and sustainable architecture that responds to the characteristics above, the following criteria can form a basis for assessment:
... sustainable architecture….

- makes substantial use of locally available materials and local means of transport;
- uses resources that are available in sufficient quantity to satisfy a general demand and not damage the environment;
- does not depend on equipment that is not easily available;
- uses skills that can be realistically developed in the community;
- can be afforded within the local socio-economic context;
- produces a durable result;
- responds to and resists the effects of the local climate;
- provides flexibility to adapt to local habits and needs;
- can be replicated by the local population.

Many successful examples of sustainable architecture already exist and match these criteria, achieved through the efforts of local initiatives and sometimes external support. More needs to be done to bring these examples to the attention of a wider audience who can learn from their example and the principles that they promote.

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