Sustainable Architecture: A Definition

by John Norton

A self-help upgrading scheme in Hydrabad, pakistan.
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Whilst one could be forgiven for defining sustainable architecture as, "buildings that will stay intact for a prolonged period", what we are in fact concerned with is the search for and the promotion of building methods that people can go on using with the skills and resources available to them.

However, this is an elusive target. The global and local context in which we live is evolving rapidly. Local approaches to achieving shelter that have in many instances been sustainable over many centuries are now unable 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 growing needs.

Declining sustainability in traditional solutions

Traditional planning and building methods were often good examples of sustainable architecture in their time, and represented good uses of local resources matched with local skills. Combined they 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. (See Encyclopaedia of Vernacular Architecture of the World[1])

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

This means that whilst there are aspects of traditional approaches that still work well, some aspects may have become inefficient or unworkable, or in general, unsustainable i.e. the local resources may no longer be available; the sheer concentration of people may require a different sort of building or simply more buildings more quickly, or the source of finance may have changed or may be insufficient.

Taken together, all these changes mean that a building method that worked well in the past in its given context may have now become difficult to afford, build and maintain, and it may no longer meet the desired requirements of the family or community. 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 more pressure 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, skills or capital that are

inaccessible to 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.

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 Is 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. Sustainable architecture implies an approach that in a development context goes beyond the project phase. There is a focus on the process as well as the end product. Sustainable architecture recognizes that while the product may wear out over time, the process remains . This process can then be repeated without resort to major external inputs.

Sustainability implies shelter solutions that can go on being achieved with the mechanisms that are or have been put in place.
Sustainable architecture brings together at least five key characteristics:

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

In practice, there is always a compromise between one or the 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, for example, may only apply to certain socio-economic groups, i.e. those who have access to housing finance. Environmental sustainability may be slightly compromised if it is compensated by financial sustainability and accessibility.

Sustainable architecture takes time to put into place
A "sustainable architecture" package cannot be transferred as a ready-made product. In searching for sustainable architectural approaches and an end result, we know that an overall idea may appear on paper to satisfy the characteristics listed above, but in practice many of these components may need to be developed to the point where they achieve sustainability in their given context. This takes time, to train and develop skills, to demonstrate an idea, or to put in place an organizational or financial system that can become sustainable.

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 18 years in Burkina Faso, Mali, Mauritania and Niger 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 ensure technical and organizational sustainability: 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 **Grameen Bank** housing loans programme in Bangladesh, where the capacity to provide and to repay housing loans has had to be developed over the years. The Bank started off giving income generation loans to the rural poor in 1976 and then moved on to housing loans 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, it took many years to reach the point where one crosses the threshold of sustainability.

Sustainable architecture is context specific
As illustrated above, the sustainable architecture approach brings together several characteristics. However, each of these characteristics 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 classify a particular building technology as being "a sustainable architecture technology", nor can one assume that a credit system that works well in one place will work well in another. But we can assess the potential of a

particular process or material to make a valid contribution towards sustainable architecture in a given locality.

When considering what techniques and approaches may potentially produce popularly accessible and sustainable architecture that responds to the characteristics above, the following criteria 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 community.*

Many successful examples of sustainable architecture already exist and match these criteria, achieved through the efforts of local initiatives and of external support. However, more needs to be done to bring these examples to the attention of a wider audience.

John Norton is Co-Chairperson of the Sustainable Architecture Task Force, a joint Hassan Fathy Institute/UNCHS (Habitat) initiative launched in 1999. One of the goals of this Task Force is to build international support for sustainable architectural processes.

References

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

2. See John Norton, "Woodless Construction - unstabilised earth brick vault and dome roofing without formwork", Building Issues, *1997, vol.9. no.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 organizations 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.*