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# Editorial

The problems of human habitat—housing, and "AFFORDABLE HOUSING" in particular—have now become a major challenge to all civil engineers, architects and material scientists. If we accept the philosophy that every family in the world has a right to have a roof over its head, then we can easily recognise that "Affordable Housing" is as much a problem to economically advanced societies as for the poor, and the socially dispossessed. We now know that the major cause of this "affordability crisis" is the dramatic increase in the process of global urbanisation as well as in the pace at which the force of urbanisation has taken place in the last quarter of the last century, both in the industrialised nations and in the developing countries of the world. In economically vibrant societies, families are now often forced out of the housing market by increasing house prices, and the high repayments amounting to 10–20% of household income. The problems are much more acute in the poor countries of the world where the effects of poverty are compounded by human conflict, and the damage and destruction brought about by storms, floods, land slides, mud slides and other natural forces arising from global warming.

It is now very clear, however, that the problems and needs of rural communities and of the poorer countries in the realm of affordable housing are very different. In developing low income housing, building materials alone can sometimes cost as much as 70–80% of the total cost. Even portland cement, a relatively cheap building material, then becomes too expensive to provide the basic shelter for them. The solutions to the world's homeless are thus extremely complex. It is in this respect that the work of architects like Samuel Mockbee and Ruth in the poverty-ridden deep southern parts of the United States becomes a shining example of sustainable construction and the use of unconventional and recycled materials—where discarded industrial wastes such as tyres, plastics, corrugated cardboard, car windows and the like are turned into weather-tight architectural shelters for people who never had them.

It is also very obvious that if we are to meet the housing needs of developing countries, we need to look beyond the conventional steel and concrete materials. There is a rich and vast range of non-conventional materials and technologies—natural, sustainable and low energy consuming building materials—such as stone, clay, earth, timber, bamboo and vegetable fibres—which have been used for thousands of years as engineering materials for low cost housing and monuments with remarkable thermal comfort in all kinds of climatic environments. A classic example is the Taj Mahal where it is reported that bamboo has been used as reinforcing bars in structural elements, and unburned clayey soils as load-bearing walls.

The use of earth as a building material, for example, dates back to 5000–4000 BC, and today some 40–50% of the world population live in earth houses. Modern technologies such as rammed earth construction and pressed earth bricks have shown that earth building can offer a sustainable and low energy construction material which, with high quality workmanship and sound design, can produce durable, cost-effective and eco-friendly housing with character, charm and long life.

However, one cannot ignore the two major weaknesses of many of these natural construction materials and traditional construction methods—their lack of durability, and their inability to maintain structural integrity when exposed to the forces of nature. It is in this respect that the book titled "History of Architecture and Ancient Building Materials in India" authored by Prof. Satish Chandra of the Institute of Environmental Science and Conservation, Goteburg University, Sweden can make "Affordable Housing" a reality for the millions of people all over the world, enmeshed in the cobweb of poverty, and the continuous cycle of hopelessness and helplessness. Much has been written and is known about the ancient history of building materials and building construction of Egyptian, Chinese, Greek and Roman cultures, but references to the architecture and building technology of ancient India is conspicuously absent in published literature. What is unique about this book is that it is scholarly and erudite, and it provides a rational and engineering elucidation of the science and technology of building materials,

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the techniques of their incorporation in load-bearing structures, the mechanisms of the interactions of their ingredients, and their contribution to durable service life spanning over thousands of years. What this book shows is that the technology of building materials is closely inter-related to and interactive with methods of building construction. In particular, the uniqueness of the book lies in its scientific elucidation of the role, mechanics and mechanisms of natural polymers in making natural building materials and building construction buildable, serviceable and durable.

The enhancement of durable service life of "affordable housing" is the key to be able to provide and enrich the Quality of Life of the peoples of the world. Our forefathers who built our human heritage knew how to use natural polymers derived from cereals, rice, pulses, animal waste, milk and milk products, eggs, sugar compounds, oils and fats, and so on... What Satish Chandra's book offers is a unique and critical evaluation of the role of natural polymers in enhancing the engineering and durability properties of eco-friendly, locally available natural construction materials. Durability need no longer be a dream, and poverty, no longer an insuperable obstacle to alleviate the affordability crisis of the poorer nations of the world. The fact that some of the most easily and readily replenishable earth's resources can be used to solve one of the most acute forms of human deprivation, is just as challenging not only to the basic human instinct of fellow feeling, but also to the science and engineering skills of advanced technologies. This book shows the way forward to achieve affordable housing to vast sections of the human race, and solve many of our ecological problems in an environmentally friendly way with local materials, natural polymers, and advanced technologies. There is no doubt that this book should be compulsory reading for all those involved in building materials and building construction, and especially to those involved with affordable housing in developing countries. The book is published by Tech Books International, 4/12, Kalkaji Extn., Kalkaji, New Delhi 110019, India, 2003, ISBN 81-88305-03-0.