

## Low Cost Building Materials

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### Introduction

Affordable housing is a term used to describe dwelling units whose total housing cost are deemed “Affordable” to a group of people within a specified income range. In India, the technology to be adopted for housing components should be such that the production and erection technology be adjusted to suite the level of skills and handling facilities available under metropolitan, urban and rural conditions.

The World Bank identified 152 developing countries as of the year 2007, of which it is reported one in two people are without adequate shelter. UN-Habitat is working to lower the statistic through the provision of low-cost, sustainable building materials and technologies while recognizing the Adequate Shelter for All agenda, committing to, “Access to safe and healthy shelter and basic services recognized as essential to a person’s physical, psychological, social and economic well-being and should be a fundamental part of our urgent actions for the millions of people in the world.

### Sustainable low-cost housing material

The link between sustainability and urban housing has been an ongoing global debate for more than two decades, failing to gain the depth of attention necessary until the late 1990s. Sustainable housing remains a relatively new concept to developing countries. While there have been different approaches and conceptions of sustainable models for development internationally, specific to climatic circumstances, addressing the major shift in the distribution between rural and urban migration and exploring stages of implementation, there are mains definitive barriers. In most developing countries, the mindset regarding sustainable development is limited to an understanding of economic growth, while to the north the focus emphasizes eco logical issues.

### Tire Veneer

Tires are essential globally, at all levels of development. Millions are discarded annually as they wear out relatively fast – this product makes use of recycling the material

into a usable material for various types of applications. The most common application is as an environmentally responsive flooring material resilient both indoors and out. Areas of use extend to areas such as sports and recreation ,animal housing and high traffic areas outdoors – and a variety of consumer products, vibration dampeners and furniture surfaces internally.

In the retreading process, the old tread is removed by grinding and the resulting dust is termed buffings.

### **Straw and Resin Panels**

Informal settlements in northern Pakistan have become the pilot site of a new technology created at MIT to provide much needed insulation and sound absorption for existing housing. Using agricultural waste, such as straw, a binder is applied that is made up of local resins to form insulating panels that can be easily installed under and between existing corrugated metal sheeting – and lightweight corrugated iron currently being used as roofing by over one million people in Pakistan alone.

The technology and construction method also mitigates added deaths when the region experiences earthquakes, as heavy earthen roofs often collapse and bury those inside. With the manufacturing is able to be carried out locally with already available materials to meet the growing needs, there is an opportunity for business creation and income generation.

### **Flax**

Flax is a plant native to the region extending from the eastern Mediterranean to India and China, and was once extensively cultivated in Egypt today flax fibers are amongst the oldest fiber crops in the world. The fiber has is soft, flexible, stronger than cotton but not as elastic. Natural insulation can be made from 100% flax fibers by matting them together into a non-woven process and then utilizing their properties for insulation in lofts or wall cavities.

### **Wood Fiber Insulation**

Wood fiber insulation panels are made from 100% pulped wood fiber with no added harmful chemicals or materials, using the dry manufacturing process there is no water treatment necessary and energy costs are low. There are various types of wood fiber insulation for different uses and purposes – floor and roof insulation and internal external

wall insulation. The thermal conductivity values range from 0.04 – 0.05 W/mK. They protect against cold in the winter and heat in the summer.

### **Corkoco**

The material is a panel made of combination cork and bioecologic coconut fiber, mainly used for acoustic insulation. The performance is specialized in providing acoustic insulation and insulation – for installation in attics, gaps, between rooms or apartments. There are two levels of performance panels available. One is simply a coconut fiber panel; the other is a sandwich of a cork panel between two sheets of coconut fiber.

### **Grancrete**

Greensulate is a low-cost, biodegradable rigid insulating composite. At the end of its life-cycle, the material biodegrades, rapidly breaking down and enriching the surrounding soil – even accelerating the rate of breakdown for surrounding and nearby waste.

### **Cement**

Cement based building materials consume vast quantities of natural resources and contribute to a large proportion of construction, demolition and similar waste. If the manufacturing of cement could be altered to reduce the carbon emissions by just 10%, it would accomplish one-fifth of the Kyoto Protocol goal of a 5.2 percent reduction in total carbon dioxide emissions. There are currently available multiple alternatives or additives that can help reduce waste and CO<sub>2</sub> emissions when applied correctly and suitably to location specifications.

### **Rice husk ash/ Pozzolanas**

Pozzolanas are materials containing reactive silica and/or alumina, which in their own right have little binding ability. Yet, when mixed with lime and water it will set and harden like cement. They are important ingredients in alternative cement compounds, making a significant contribution towards low-cost materials. Rice husks are a large by-product – one ton is produced per five tons of rice paddy, and it is estimated that 120 million tons of husk could be available annually on a global basis. Rice is a major crop in many third world countries – including China and the Indian sub-continent, South-east Asia and in some regions of Africa and South America. Weight for weight, rice husk contains an energy value about half that of coal, and is therefore an important energy source, though it must be

consumed close to natural production as transportation is a very unviable option. Only 20% of its weight may be utilized as a pozzolana.

### **Conclusion**

Housing is one of mankind's most fundamental requirements in terms of protection, security, self-esteem, social status, cultural identity, fulfillment, and success. After analyzing various methods for low-cost building systems, the best method to use is natural materials, renewable materials, eco-friendly building materials, using locally available materials, minimizing resource allocation, and implementing innovative methods to reduce costs and achieve sustainable and green building.

