Shrashtant Patara: We "Re-materialize"

The material intensity of mainstream building practices is unsustainable. Gains in material efficiency have been nullified by the rapid growth in construction volumes to fulfill unmet demand and aspirational consumption. Basic housing and infrastructure needs of India and other emerging economies are expected to grow exponentially for at least the next three decades. Growing nations will have to aggressively set forth on a path of relative de-coupling between infrastructure development and the intensity with which virgin raw materials and fossil-fuel based energy is used in construction. In more mature economies, significantly greater emphasis will have to be placed on strategies for absolute de-coupling between resource use and service delivery.

There is an urgent need to promote the widespread adoption of production and service delivery mechanisms that serve any, or a combination, of the following goals:

- "We-materialize" – people become an integral part of the material production and application value chain; not being reduced to just consumers of goods made by machines and robots.
- "Re-materialize" – material flows emanate much more significantly from waste that is generated within local communities, particularly dense urban settlements; or, through the intelligent use of composite materials, aeration and other innovations that rely on the laws of physics.

Looking into the future, next generation solutions from the realm of chemistry, biology and information technology in which symbiotic relationships are created between material and energy flows within a building would be critical in creating "green jobs" and reducing our ecologically debilitating dependence on natural resources.

Efforts aimed at de-materializing construction must go beyond the relatively narrow boundaries of technological innovation and the application of industrially produced building materials on a large scale. To de-materialize, we must innovate; and a large part of the innovation process must be aligned to the realities of de-centralized contexts. Micro- and small-scale service providers will have to be equipped with the tools to deliver high-performance habitat solutions from within local production systems; employing processes in which they are able to add value to renewable resources.

Technology, know-how and skill development-driven solutions for large scale, yet decentralized production of building materials are such tools. The dissemination of Micro-Concrete Roofing technology in India and dozens of other countries in the world is a case in point. Supported by the Swiss government and cement industry for a decade between 1994 and 2003, the technology is now "liberated" in India, with approximately 1,200 entrepreneurs having installed over 600 million roofing tiles and created more than 7,200 direct jobs with an average investment of only USD 5,600 per enterprise (at current prices). Made with cement, about 40% of the tile consists of waste from stone crushers, otherwise used as landfill.

Supply chains that transport finished products across vast distances and through a large number of intermediaries are more than likely to get stretched and eventually, broken. Large businesses of the future will therefore be compelled to market goods and services through business networks that empower the micro-and small-scale service provider to create value locally by up-cycling a diverse range of materials, particularly waste, into safe, strong, energy saving and easily usable building material.

Typically, as big brands continue to become more valuable assets for both large corporations and small entrepreneurs, franchising models would be the most competitively placed to deliver solutions at scale; particularly to the hundreds of millions of households that still have unmet shelter needs. The corporation could use its access to cutting edge research on materials and processes to put together "enterprise-in-a- box" packages of technology and know-how for local entrepreneurs; adding a few critical inputs to secure their own revenues on a recurring and long-term basis.

The growth trajectory described here stands out as an absolute imperative, not only from the point of view of maintaining a healthy balance of our material resources, but also on account of the broader environmental, social and economic goals of sustainable development. One is therefore tempted to ask, "Who wants to be the McDonalds of sustainable construction?"

"Waste-to-wealth": A Micro-Concrete Roofing enterprise in rural India - using technology and know-how to "Re-materialize".