Earthbag Technology: Presented by Good Earth Nepal

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Conventional building is toxic to the environment. The manufacture of cement, bricks and steel pollutes our air and water; logging and mining deplete scarce natural resources. Delivery, usually by truck, clogs roads, eats fuel and burns carbon. High prices force the rural poor to build with more accessible mud, clay, stone and straw, often catastrophic in the face of earthquake, flood and typhoon.
Relying on soil obtained from the worksite, Earthbag technology is an inexpensive, simple and environmentally sustainable method for building structures able to endure earthquake (to magnitude 9), fire, flood, and wind. Now used in disaster-prone zones all over the world, Earthbag technology makes minimal use of cement, concrete, steel and timber-and the fuel and vehicles needed to transport them. Earthbag technology requires only the simplest of tools, no electricity, and costs considerably less than more conventional building methods.

Though relatively “new”, the basic principles behind Earthbag technology have existed for centuries. Sometimes called “Rammed Earth in a Bag” or “Reinforced Rammed Earth”, the strength and resilience of Earthbag designs and buildings have been confirmed both in the lab and in the field.

In perhaps the best measure of the technology, in 2015, all 55 Earthbag structures built in Nepal survived a devastating 7.8 magnitude earthquake with no structural damage, often standing beside the shells of ruined buildings. This, and the displacement of over three million residents, triggered an unprecedented boom in Earthbag building throughout Nepal. Now, for the first time, we have the opportunity to truly develop and scale the technology, first in Nepal and then to communities worldwide.

Soil taken from the construction site is stuffed inside plastic bags, which are then staggered like masonry. Tamped down, the bags become rock-hard in a month or two. Barbed wire, instead of cement, serves as the mortar. In seismically-active zones, reinforcing buttresses, rebar and bond beams are added as needed, and the building "floats" on an innovative rubble trench foundation, minimizing shockwaves.

As the building nears completion, a lightweight roof is installed, and the building is plastered and painted. Inside and out, Earthbag homes and schools look just like "normal" homes and schools in the community, making them desirable and culturally acceptable. With routine maintenance, they'll last for centuries.
Earthbag construction does not require any special tools or machinery; an Earthbag home or school can easily be built by a group of unskilled workers under the supervision of a construction manager. Properly taught, village builders can learn the technique themselves.

Advantages of Earthbag Technology:

Safety: Earthbag technology has now been tried and tested in Nepal and elsewhere, with traditional techniques tragically failing

Reduced Use of Materials and Transport: Earthbag structures require minimal cement, concrete, wood and steel; thereby lessening need for transport and lowering fuel costs

Less Pollution: Building with soil means fewer factories and trucks, less fuel usage, and reduced depletion of natural resources

Ease of Construction: Earthbag technology requires no masons and few skilled workers, and is easily adopted by local communities

Cost-Effective: Earthbag homes and schools cost substantially less than traditional methods

Earthbag construction offers a safe, affordable and environmentally sustainable building method. Widespread adoption of this developing technology will result in stronger, safer communities and a cleaner, more livable planet.