# Ecological exits

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India offers no shortage of ways in which to dispose of the dead. There is cremation, both traditional and furnace (electric or gas run), burials of varying kinds and the Zoroastrian ritual of exposing the dead to the natural elements. One can also leave one's body for medical and scientific use – or have this happen less willingly as is evident from the shadowy trade in skeletons that is said to operate from Eastern India.

But people are always coming up with new ways. It is an indication, perhaps, of how all existing ways seem to fall short on some parameter – dignity, cost, environmental or religious concerns – which leads people to tinker and find new solutions. Deepak Gadhia, for example, is a solar power specialist whose company designed one of the largest solar cookers in the world, to cook meals for pilgrims at Tirupati.

Mr.Gadhia has now sold his company and retired to the Muni Seva Ashram in Vadodara, but has retained his interest in using solar power to fuel an eco-crematorium. He tells me that he has designed a 50 square meter solar dish for a proposed crematorium, but he adds that they are waiting to put in a biogas chamber, presumably as back-up, before the project goes active.

High Teck Engineering and Eco Solutions, based in Aluva, Kerala, already has a functioning crematorium product. This is a design for a LPG fired crematorium developed by the company under Mr.E.Sivaramakrishnan, which it now selling as a complete solutions product. The company claims that LPG is far more energy efficient than wood or electricity, offering 11800Kcal/kg versus 860 Kcal/ Unit for electricity and 3000 Kcal/lKg for wood. Since it burns hotter it finishes the process in just an hour, whereas electricity takes two to three hours and wood takes four to six.

Mr.John Thomas, now the MD of High-Teck, tells me that the cost for setting up a full-fledged LPG crematorium unit is Rs16.5 lakhs and that 25 have been installed already in Kerala. Recently the company has ventured outside the state to set up three in Punjab. This growth of this energy efficient crematorium business is one reason why the company, which started out as a gasket manufacturer, has changed its name from High Tech Seals to add on the Eco Solutions part of its name.

The Energy and Resources Institute (TERI) has also developed an energy efficient crematorium which instead of directly burning biomass (like wood) as fuel, first converts it into a gas that burns with far more fuel efficiency. This is done through a device call a gasifier, which can even use material like sawdust, as long as it is compressed into briquettes. This reduces the amount of wood needed and also burns with little pollution and faster – a biomass driven crematorium can finish in an hour.

Even these energy efficient options pose some environmental problems. The air-pollution it causes can be reduced with filters and, in any case, Mary Roach points out in Stiff, her fascinating book on the afterlives of corpses, crematoria "emit about half as much particulate matter as a residential fireplace and about as much nitrous oxide as a restaurant grill." The bigger concern is the mercury in dental fillings of the corpses, which gets ejected as toxic mercury vapour into the air, but this is

obviously a greater concern in Western countries with more dental care.

But the real environmental ideal would be to create a corpse disposal system that is low energy and could find some environmental value in the remains. The easiest way to do this is with green burials, where the corpse goes in a coffin that is rapidly bio-degradeable and can be planted with trees that are nourished by the remains. There is a trend for this in the US, but it still requires land for burial. The Zoroastrian system of exposing the dead for vultures to eat is clearly ideal, but it is not on offer in many places or across communities.

Roach notes that some proponents of ecological disposal have gone to rather scary extremes. Dr.George Hay, a 19th century chemist advocated pulverizing bodies for use as manure. Since this required making them into, as he wrote, “a pulpous mass of raw meat and raw bones” which would then have to be dried for convenience in use, it is easy to see why this scheme didn’t find takers. But essentially the same process has now been recreated in a much more acceptable way by Susanne Wiigh-Masak, a Swedish biologist, and this well become a popular option in such an environmentally conscious country.

Wiigh-Masak’s process works by concealing the pulverisation. Instead of doing it mechanically, the process first freeze dries the corpse in liquid nitrogen and then uses ultrasound to reduce the brittle remains into small pieces. These are further reduced into powder that can be disposed of like ashes, but since they are essentially a form of compost they can be used as growing medium for plants. Wiigh-Masak has been more careful that Dr.Hay to respect the sentiments of the living – for example, Roach notes that she refuses to let the technology be used on pets since that might debase it for human beings – and her process is attracting serious attention in the Swedish funeral business.

But even this is not the cutting edge of environmental undertaking these days. That would be a system that first became operational in Australia, and is now being tried out in the USA as well. It is known as resomation and involves immersing the body in a vat of heated alkaline liquid which will rapidly reduce it to liquid form. This process involve little use of energy and while it does get negative reactions of “boiling in acid”, it is in fact the opposite process, where alkalis dissolve the body and, if the amount of alkali used is precisely calculated, gives an end result of a chemically neutral liquid that can be disposed of with no environmental contamination.

Of course, exactly what form this liquid disposal might take is a sticking point. The obvious solution of pouring it down the drain has equally obvious negatives from an emotional, if not rational, point of view. The liquid could be dried to give an ash like powder or could be used for irrigation. It could even be poured into a river or the sea, which would give some consonance with Indian traditions – better to have neutral liquid, rather than half-burned corpses being discharged into our holy rivers.

Even the name coined for the process in Australia is interesting: Aquamation, which suggests some pleasantly watery end. This is hardly likely to be the last attempt to find an ideal way to dispose of the dead, but it is one that perhaps deserves a better fate than other such endeavours have received.

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