

Wood-based, low-cost, environment-friendly crematorium

STATE AWARD

Kambel Chulai (64), is a resident of Jowai town in Jaintia Hills District of Meghalaya. A class III dropout, he has been an innovator right from his childhood. When he was 13 years old he was restricted from playing football and marbles with the other boys, because he had to carry his baby sister on his back. His solution was not to brood or complain but to make use of his skills to make a complete set of miniature knives and ploughs (till today they look like the work of a skilled craftsman) to play with. Due to financial constraints he had to join an automobile workshop as an apprentice in his early teens and since then he has moonlighted as a sculptor, artist, architect, jeweller, movie operator, mechanic, sewing machine mechanic, dramatist, architect/builder etc., all this without any formal training. In 1963 he manufactured a black and white camera without any reference to existing craft/ literature /model of a camera and it is still working today. Currently Kambel Chulai is pursuing the profession of a jeweller. It is amazing to note that the desire to help others becomes so strong in some people that they overcome all obstacles and limitations to realize their dreams and ideas, often inviting the ridicule of the same people that they set out to help. Kambel Chulai also belongs to this extremely rare class of people who would dare give up everything because of their strong belief in their dreams.

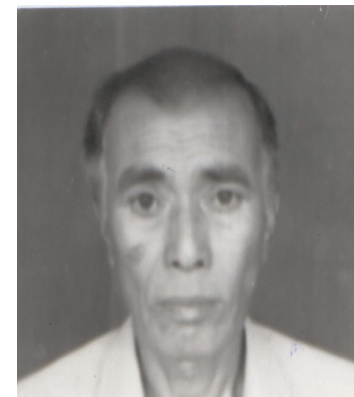
Genesis

The seeds of this innovation were sown in 1988-89 when Kambel Chulai started thinking about the issues and problems regarding the traditional method of cremation being practised by his people: it was highly polluting, time consuming, difficult during the rainy season and more important very heavy on the pocket of the family of the deceased.

In 1995, Kambel Chulai made a model and prototype of his innovation that would eventually revolutionize the cremation scene in the Jaintia Hills. But unfortunately, at that time his idea was turned down by the people and the all-powerful religious organization. Sein Raij Jowai of the Jaintia people due to the initial cost and the fear and apprehension

associated with doing something old in a new way.

Though faced with this initial hurdle, he was not deterred and kept on pressing his idea at every available opportunity. Eventually he succeeded and finally in 1999, when the progressive Mr. G.H. Barch became the general secretary of the Sein Raij, the project was given the go ahead, albeit with a lot of opposition from various sides. In 2001, a fete was organized in which the initial building cost of Rs.3, 00,000 was raised. With periodic working capital investments through contributions by individuals and the Sein Raij, work commenced in 2002 and was completed in 2003. The entire structure that houses the crematorium has been built with a cost of around Rs.15 lakhs. The crematorium



Address

Loompyrdi Jonigpiah, Jowai,
Dist.:Jaintia Hills, Meghalaya

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room along with the crematorium and the chimney has been built at a cost of around Rs.7.5 lakhs. All the materials used in the building have been sourced locally except for the fire resistant bricks that line the crematorium itself. These have been procured from Durgapur in West Bengal. This crematorium has been installed and formally accepted in the town of Jowai, in Meghalaya in May, 2003. It will be catering to the 3,00,000 strong Jaintia community there.

The innovation

This crematorium is an improvisation over the normal Open Wooden Pyre Crematorium (WPC). It appears to be "a hybrid concept" of electric and open type crematorium. By providing a small chamber and closing it with thick walls (insulator), the crematorium generates high temperature around the human body which is sufficient to turn it to ashes in an hour and fifteen minutes. The whole structure is around 50 ft in length and 30 ft in width at its widest part. It is divided into a hallway in the middle, a rest room at one end and the room that houses the crematorium itself, at the other end. The crematorium room is around 14 x 14 feet with the crematorium in the middle. It is a longish structure that is open at one end and connected to a 36 feet high chimney at the other. The chimney has a cover that can be operated from outside to control the heat and the intensity of the flames inside the oven. For the free flow of air, there are two small openings at both sides. The crematorium itself is around five feet high and eight feet long. It has a lining of fire resistant bricks and is covered with five removable iron sheets. Along the bottom there are five removable iron grills with the same number of iron plates below them. Below ground level, the space has been filled with locally sourced granite stones up to a depth of around six feet.

Process of cremation

Inside the crematorium the corpse is laid over the grill and covered with firewood. Next, the iron sheets are placed over the crematorium to cover the whole structure except at the mouth, which is kept open. After this the wood is ignited and utilizing the contraption that has been added to the chimney, the heat and

intensity of the flames are controlled. In about an hour and fifteen minutes burning is completed. Next, the grill and the iron plates are extracted and doused with water to cool them down. From these cooled plates the bone remains are then separated from the wood ashes and presented to the family of the deceased.

Advantages over existing alternatives

Existing devices for cremation are the Open Wooden Pyre Crematorium (WPC) and the electric crematorium. The Open Wooden Pyre Crematorium (WPC) needs substantial logs of wood and usually an entire pine tree had to be chopped down for the funeral pyre. This would cost the family of the deceased around Rs.3000. Whereas Closed Wooden Crematoriums (CWC) like the one made by Kambel Chulai can operate with much less wood and the cost is limited to Rs.250. Earlier, the funeral pyre had to be tended for a full day while the new method restricts the time to one hour fifteen

minutes. The Open Wooden Pyre Crematorium would spew out dense noxious fumes, throughout the day, which enveloped the whole area. Kambel Chulai's innovation - by restricting the amount of wood used and the time duration - eliminates this problem by reducing the smoke and fumes by 90%. Also since it is open to the atmosphere, the temperature around the body is not as high in the WPC as in the closed one. Cremation in the CWC is unaffected by rains whereas



in the WPC operation, it can be affected by wood being soaked.

In the electric crematorium, the body burns at 700 ° C temperature. Parts of the body that are not completely burned during the first process, are burnt again at 1150°- 1200° C temperature in a super combustion chamber to make it pollution free, as partially burned body hydrocarbons are not good for the environment. The cost of burning one body is around Rs.250-280 and at least 40-50 minutes time is required. Electric Crematoriums need high power installation and should have continuity of supply. Compared to this Kambel Chulai's crematorium can operate independent of electricity. The cost of an electric crematorium is around Rs.32 lakhs which includes the cost of pollution control equipment and super combustion chamber and various other features whereas Kambel Chulai's crematorium costs Rs.15 lakhs. The relevance of Chulai's crematorium being that cremation is done in a traditionally acceptable manner at minimal cost and reduced time.

Approval from the formal sector

According to Mr.S.S. Dasgupta, Chartered engineer, advisor at Indomen Engineering Service, the innovation is definitely an improvement on the conventional cremation practices followed till now i.e. burning pine wood. There is a lot of saving in consumption of wood, which besides saving costs ensures preservation of our precious natural resources.

Of great social relevance

Meghalaya, known to the outside world as the abode of clouds is populated by three major tribes; the Khasis centred around Shillong, the Garos with their centre in Tura and the Jaintias with their centre at Jowai. In Meghalaya two religions are mainly followed: Christianity and the traditional animistic religions of the Khasis, Garos and Jaintias. In all respects the people are guided by the teachings of either of these two religions and follow the rules and regulations from birth to death. Accordingly in adherence to the rules of the concerned religion, 55 percent of the Jaintias follow the traditional practice of cremation at death. Tradition dictates that the wood required for the cremation should be procured on the day of the death and this is to be followed by the cremation itself on the second day. This method has been documented right from the initiation of their history in Meghalaya, but modern times have found this method to be quite burdensome and problematic due to environmental concerns, because of the resultant depletion of forests as well as the pollution due to the emission of smoke and fumes during the entire process of cremation. The Jaintia people who practice this system had always viewed this problem as a necessary evil. Now with the innovation of Kambel Chulai they have a solution which adheres to their customs and is eco-friendly too. This innovation has great potential in that it can be adopted in any place where the culture or religion specifies cremation instead of burial.