

Ice cones bring hope to Himalayas

ICE STUPA PROJECT/LORZANG DADUL

THE TIMES | Saturday June 1 2019



Ice stupas can hold millions of litres of water which they release slowly from spring, helping farmers in the planting season

A village contest to provide water shows how the world could counter climate change, writes **Hugh Tomlinson**

A competition is under way in the Himalayas that could change the course of history. The contestants are mountain villagers in northern India who are fighting for survival in one of the harshest environments on the planet.

The organisers hope that their example can inspire solutions to the greatest challenge facing mankind.

Artificial glaciers are being created across a string of villages in the mountain-desert of Ladakh in a frantic effort to rebuild fractions of the ice sheets that are shrinking around them. These towers of ice in a region facing devastation through climate change could secure a critical water supply through the barren summer months.

The man-made glaciers are built as a *stupa*, Sanskrit for a pile or heap — conical towers of ice that mirror the Buddhist shrines seen throughout the region. The ice piles are the brainchild of Sonam Wangchuk, a local engineer, and have been seized on by the villagers as an affordable solution to the disaster that looms over the region as the Himalayan ice sheets retreat, threatening water supplies to two billion people across Asia.

The technology is simple. The *stupas* are created in winter with water piped down from streams and glacial run-off to sprinklers that shoot the liquid into the air at night, when temperatures plummet to minus 20C, freezing as it falls. The biggest *stupas* can reach up to ten storeys high, leaving a vast cone of ice holding millions of litres of water.

When spring arrives the *stupa* begins to thaw but the conical structure minimises exposure to sunlight and the core remains frozen for months. The biggest

stupas do not melt fully until July, releasing 5,000 litres of water a day, enough to carry farmers through the crucial planting season. The competitors are vying to store the most water.

"We are not promoting this as a solution to climate change," Deskrit Angmo, 27, the project manager, said. "We are just desperate to highlight the issue. This is a desperate solution for moun-

tain communities suffering the worst effects of climate change and drought."

Ladakh is jammed against the border with China in the shadow of the Himalayas at an altitude above 3,000 metres. It is a land of staggering beauty but life has always been hard.

The region receives only 10cm of rainfall a year and farming depends on the run-off from glaciers. As the ice

sheets shrink, water supplies have become erratic. Ladakh can experience flash floods but more often the region suffers extended drought and the problem will worsen as the glaciers vanish.

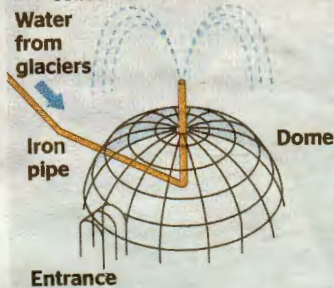
Caught between two of the worst polluters, India and China, a sense of doom is creeping across the Himalayas. A report in February found that a third of the glaciers in the Himalayas and

Hindu Kush will be gone by the end of the century, even if global carbon emissions are cut dramatically. If emissions remain at their present level, two thirds of Asia's ice fields will vanish.

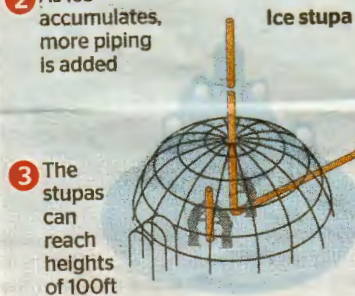
No one is pretending that the ice stupas can halt the march of climate change but they offer respite for communities powerless to affect the forces ranged against them. Local interest has

How they are built

- 1 Water is sprinkled on a dome covered with mesh where it collects and freezes



- 2 As ice accumulates, more piping is added



- 3 The stupas can reach heights of 100ft

swelled since Mr Wangchuk, 52, built his first stupas with a crowdfunding campaign in 2013.

In the first competition last year 12 villages took part, paying £1,000 apiece for the equipment. This year about 20 villages entered. Some of the contestants last year were so impressed with the results they are building more. The resemblance to Buddhist stupas, places of worship, has struck a chord.

"We hope that they [the ice stupas] will inspire other ideas that can help the world to tackle this problem," Ms Angmo said. "You cannot replicate a glacier but there are plans to expand this on a bigger scale."

Stupas are now being built in the Alps and the Ladakh project has had inquiries from Canada. Closer to home, villages across the border in Pakistan have copied the scheme.

Other Indian states are considering creating stupas as tourist attractions.

"One village last year built an ice café in the hollow of their cone," Ms Angmo said. "There are plans to build bigger stupas for ice-climbing to attract western tourism. We just want to help these struggling communities and keep raising the issue."