An engineer eager to help poor farmers is about to see his dream come true, reports **Rachel Bridge**

JUSTIN GRIFFITHS-WILLIAMS

Final stage: Smith is perfecting his solar pump at labs in Oxford

My pump will bring water to the world

An experiment in a Devon field this spring could provide farmers in the developing world with a simple but effective way to irrigate their fields.

For a few months, a low-cost solar irrigation pump — with no moving parts — will be tested several times an hour by an engineer at a site near Tiverton to see if it can withstand the rigours of being used as far afield as Bangladesh and Brazil.

The venture is the brainchild of Tom Smith, a Cambridge engineering PhD. Five years ago, Smith won The Sunday Times' One Minute Pitch, sponsored by Virgin Money, and was given £100,000 to develop the pump. He had one minute to persuade our judges — including Allan Leighton, then chairman of Royal Mail, and Sir Tom Hunter, the entrepreneur — that his idea to lift water from below ground deserved the prize.

Now Smith, 33, is on the brink of seeing his dream become reality. Alongside the trial in Devon, he is sending four identical prototypes to be tested in Brazil and India and hopefully California and Spain.

If the pumps work as they are supposed to, full commercial production could begin next year.

"When we get through this, it will be the right time to take a big risk and tool up for production, which will be a very expensive and risky process," he said. "At some stage, you have to bite the bullet."

Smith said progress has been slower than he hoped, held back by the loss of a potential partnership with a large American industrial company, differences in strategy with a former development partner, and the constant need to find more funding.

In the past few months, however, there have been big strides forward. Smith initially thought he would have to develop a commercial application, in the form of an energy-efficient way of circulating hot water in domestic central-heating systems, to sustain his aim of helping Third World farmers. But he has since realised that the pump itself could have a commercial application as well as a humanitarian one, with farmers in California and southern Europe already expressing interest.

Smith, who has set up Thermofluidics to develop the pump, said: "Farming needs and water needs are universal — they are not confined to the developing world. It may be that we sell pumps of different specifications in different regions but using the same basic technology."

Another advance has come with the involvement of Mark Bryant, a former managing director at Accenture, who read about Smith's project in The Sunday Times and has invested £100,000 of his own money and taken on the role of chief executive.

Smith has attracted funding from the Carbon Trust, which is putting up £300,000 of the £500,000 cost of running the trials, and the California Energy Commission. He is also collaborating with Jain Irrigation Systems in India.

He has also invented a second pump, which can get water from 100 metres below the ground. Smith, who has filed a patent for the invention, said: "We are finding many of the Third World applications are in arid and semi-arid regions which require lifting water from deep under ground."

The second pump fits well with his existing technology, but can also be used with other forms of pump to enable people to get water out of much more difficult sites than they can at present.

Born in Cambridge and brought up in Haddenham, a village in the Fens, Smith created things in his childhood, including model aircraft and a tree house. After leaving school, he spent eight months in the Andes at an experimental farm that was trying to revive ancient farming techniques. It was here that he found an interest in agriculture in the developing world.

He returned to study physics at Imperial College London, and during the course conceived the idea for his pump. He was staying in a hot flat on holiday in Paris and wondered if it would be possible to use some of the energy beating down on the roof to cool the room.

Having started work on his project at Cambridge and then Exeter University, Smith is now working at laboratories in Oxford University but hopes to move his company into its own space this year.

He still has half the £100,000 from The Sunday Times competition. "It has funded me through the difficult times," he said. "I would have had to give up had I not had that money."

He is now looking for a large industrial partner to invest in the project and help take it forward.

Having tasted exhaustion, doubt and despair over the past five years, he is excited at the prospects ahead. "So many things are going in the right direction. Things are going to happen a lot faster now."

Raised by the sun

THE pump Tom Smith has developed is powered by the sun's heat, so it can be used in places that have no electricity. Because it has no moving parts or precision components, it can be produced cheaply. Smith hopes it will cost about £50 to make each pump.

There have been other pumps with no moving parts but the aspect that will make Smith's device so useful is that he has managed to increase the pressure it can generate. It will be able to lift water from below the ground to irrigate fields.