come to the help of the US, it should quit Af- Taliban government of Mullah Omar would

*The writer is a strategic affairs analyst.*

# 'Floods destroy four million tonnes of rice'

*That a water-intensive crop like rice cannot endure even four days of submergence spells a cruel irony for the world's millions of largely impoverished paddy growers.* ***Pamela Ronald****, a plant pathologist from the University of California, Davis, has helped create a strain of flood-resistant rice, all set to be introduced in India and Bangladesh. She spoke to* ***Harsh Kabra****:*

Q&A

**■ What gives Swarna-Submergence1 its ability to tolerate flooding?**

Rice is the primary food for more than three billion people. Each year millions of small farmers in the poorest areas of the world lose their entire crops to submergence. Approximately one-fourth of the global rice crop is grown in rain-fed, lowland plots prone to unpredictable flash floods that may occur at any growth stage of the rice crop. When the plant is covered with water, its oxygen and carbon dioxide supplies are reduced, which interferes with photosynthesis and respiration and inhibits its growth.

In Bangladesh and India, four million tonnes of rice are lost each year to flooding, enough to feed 30 million people. We have identified a gene called Sub1A that makes rice not only tolerant of being submerged in water but also produce high yields and retain other beneficial qualities. We have introduced this gene into agronomically important varieties.

**■ How do you assess its benefits? Would it be costlier?**

Cultivation of the new variety is expected to increase food security for 70 million of the world's poorest people. There would be no change in cost to the farmer or the consumer. Notably, farmers have reported obtaining a two- to fivefold increase in yield with this type under conditions of flooding. It is expected to be certified shortly and will be widely available this year.

**■ Would this be subject to the strict regulatory approval process required for genetically modified crops?**

The term genetically modified organism is misused and misunderstood despite an 8,000-year history of genetic modification using techniques such as hybridisation, mutagenesis and embryo rescue. Today, everything we eat has been genetically modified in some way. Studies conclude that genetic engineering, which uses a direct method to introduce new genes into a crop, is not inherently hazardous. It depends on the genes that are inserted. The genetic modification method we used to create submergence-tolerant rice is called precision breeding, which is a hybrid between genetic engineering and conventional genetic modification.

We used DNA technology to detect the inheritance of the Sub1A gene to seedlings resulting from a genetic cross between a variety from eastern India – which was not being used much due to low yield and poor flavour but carried the rare Sub1A gene for tolerance – with the locally adapted modern variety called Swarna. The resulting Sub1-Swarna variety has a taste and yield favoured by consumers and is subject only to standard seed certification.