

Doomsday vault to avert world famine

- 12 January 2006
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WITHIN a large concrete room, hewn out of a mountain on a freezing-cold island just 1000 kilometres from the North Pole, could lie the future of humanity.

The room is a "doomsday vault" designed to hold around 2 million seeds, representing all known varieties of the world's crops. It is being built to safeguard the world's food supply against nuclear war, climate change, terrorism, rising sea levels, earthquakes and the ensuing collapse of electricity supplies. "If the worst came to the worst, this would allow the world to reconstruct agriculture on this planet," says Cary Fowler, director of the Global Crop Diversity Trust, an independent international organisation promoting the project.

New Scientist has learned that the Norwegian government is planning to create the seed bank next year at the behest of crop scientists. The \$3 million vault will be built deep inside a sandstone mountain lined with permafrost on the Norwegian Arctic island of Spitsbergen. The vault will have metre-thick walls of reinforced concrete and will be protected behind two airlocks and high-security blast-proof doors. It will not be permanently manned, but "the mountains are patrolled by polar bears", says Fowler.

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The vault's seed collection, made up of duplicates of those already held at other seed banks, will represent the products of some 10,000 years of plant breeding by the world's farmers. Though most are no longer widely planted, the varieties contain vital genetic traits still regularly used in plant breeding.

To survive, the seeds need freezing temperatures. Operators plan to replace the air inside the vault each winter, when temperatures in Spitsbergen are around -18 °C. But even if some catastrophe meant that the vault was abandoned, the permafrost would keep the seeds viable. And even accelerated global warming would take many decades to penetrate the mountain vault.

"This will be the world's most secure gene bank by some orders of magnitude," says Fowler. "But its seeds will only be used when all other samples have gone for some reason. It is a fail-safe depository, rather than a conventional seed bank."

Norway first proposed the project in the 1980s but it was shelved because of security concerns: under an international treaty the Soviet Union had access to Spitsbergen at the time. With the end of the cold war and the signing of the International Treaty on Plant Genetic Resources, which gives legal protection to national crops, the door was open for the idea's revival.

The project also comes at a time when there is growing concern about the safety of existing seed banks around the world. Many have been criticised for their poor security, ageing refrigeration systems and vulnerable electricity supplies. In the late 1980s, terrorists ransacked an international potato seed bank in the Peruvian Andes, while more recently anti-globalisation campaigners have demonstrated against other banks.

The new Fort Knox for the world's crops will start by taking seeds from the network of seed banks run in the Philippines, Mexico, Syria, Nigeria and elsewhere by the Consultative Group on International Agricultural Research, which is part-funded by the World Bank. "We will then add samples from elsewhere until we have a complete set of the world's crop varieties," says Fowler.

The scheme won UN approval at a meeting of the Food and Agriculture Organization in Rome last October. A feasibility study said the facility "would essentially be built to last

forever".

From issue 2534 of New Scientist magazine, 12 January 2006, page 1