

## First consignment of Forest Tree Seeds embarks Global Seed Vault at Svalbard

Svalbard is a Norwegian archipelago in the Arctic Ocean, situated halfway between Norway and the North Pole. Funded by the Norwegian government for construction, the seed vault was built inside a sandstone mountain in an Island Spitsbergen with tight security features. The seed vault is managed under a tripartite agreement between the Norwegian government, Global Crop Diversity Trust (GCDT) and the Nordic Genetic Resource Centre (Nordgen). The Svalbard Global Seed Vault's mission is to provide a safety measure against accidental loss of plant diversity in traditional gene banks in case of any natural calamity or major disaster. It is able to protect up to 2.25 billion seeds from even "doomsday" scenarios like asteroid impacts and nuclear war. Hence it is also popularly known as the 'Doomsday vault' and began its function in the year 2008.



**Global seed vault**



**Illustration of vault's storage**

The site of island at Spitsbergen was selected for storage as it is free from the tectonic activity zone and it possesses the permafrost facility which eases the process of preservation. The vault at present stores about 840000 seed varieties, exclusively of food crops. For the first time in history, the frozen depository has accepted a delivery of forest tree seeds. The two tree seeds to embark the repository are the Norway spruce (*Picea abies*) and Scots pine (*Pinus sylvestris*). The seeds of both the tree species were collected from the natural forests in Finland and Norway.



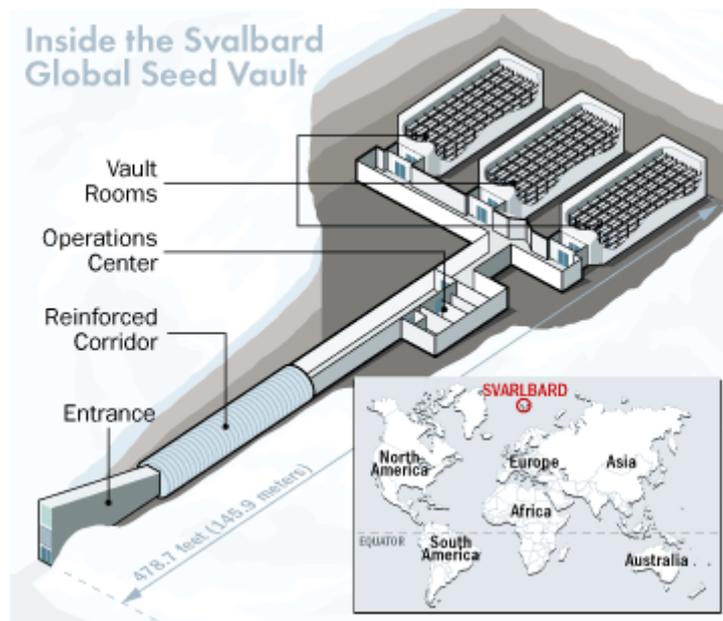
**Seeds of *P. abies***



**Storage racks inside the vault**

They formed the first consignment of tree seeds for the vault from a consortium of organisations across the Nordic nations. The species were selected because the trees play an important role, economically, ecologically and socially. Researchers mainly hope that the tree seed samples will help monitor long-term genetic changes in natural forests. "The possibility to have seed samples stored in the vault is a great opportunity to complement our forest tree gene conservation, which is based on *in situ* gene reserve forests," explained Mari Rusanen, a researcher for Natural Resources Institute Finland (Luke), one of the organisations involved in the seed collection.

"The beauty of *in situ* conservation is in its dynamic nature - we aim to conserve natural genetic diversity *per se*, rather than specific genes or genotypes. However, in the seed vault we will have long-term, *ex situ*, conservation/preservation of the existing genetic composition of the selected gene reserve forests" said Ms. Rusanen. She opined that the vault offered peace of mind and security in the unlikely event of a devastating human or natural disaster. Further she added, "For me, personally, the catastrophe scheme is not a major motivation."It is more important that these samples will, in the future, provide an opportunity to monitor long-term changes in the genetic composition of our natural forests."



Inside the vault (image from [howstuffworks.com](http://howstuffworks.com))

Brian Lainoff from the Global Crop Diversity Trust (GCDDT), which operates the Svalbard Global Seed Vault, explained that there were a number of reasons behind the decision to deposit forest tree seeds in the frozen outpost. "The genetic diversity of forest tree species worldwide is influenced by a number of factors, of which climate change and forest management activities are most important for the major forest tree species," he told BBC News. "Fragmentation of populations, browsing, pests and diseases are other factors of varying importance." Mr Lainoff added that while the Nordic consortium's seeds were the first to enter the vault, further accessions of tree seeds would be contributed from other nations. Thus the repository will secure, for centuries, millions of seeds representing every important crop variety available in the world today and by starting the acceptance of forest tree seeds for long-term storage, the vault has created a new era in the field of forest genetics.

In India, the Defence Institute of High Altitude Research (DIHAR) has created a National Permafrost-based Germplasm Storage Facility to aid freeze preservation of vegetables, to standardize the post-harvest technology of perishable food items and to understand their high altitude physiology. The facility is situated in Leh, at an altitude of 5360 m in the Himalayas and is controlled and maintained by Defence Research and Development Organization of Defence Ministry. The same facility can be enhanced or the infrastructure may be improved for storage of tree seeds and other tree reproductive materials. The collection and supply of tree germplasm from various states can be ensured and co-ordinated by the Ministry of Environment, Forest and Climate Change so that an improvised *ex-situ* gene bank will be available for forest germplasm. This can be upgraded or formed as a National Seed Storage Vault, the one similar to Svalbard's repository.

**Source:**

<http://www.bbc.com/news/science-environment-31661288>