



Pope Francis uses incense as he venerates a statue of Mary during Mass in Verano cemetery in Rome in this Nov. 1, 2015, file photo. Conflict, climate change and poverty are driving the demise of the tree that produces frankincense resin. (CNS/Paul Haring)

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The Gospel of Matthew never details how many Magi came from "the East," but it makes it clear they traveled to pay homage to "the newborn king of the Jews" and "offered him gifts of gold, frankincense and myrrh."

Beyond their great monetary value, scholars say, the gifts had deep symbolic significance: gold for the Christ child's nobility as king of the Jews; frankincense, which was burned in religious ceremonies, for his divinity; and myrrh, which was used on cuts or wounds and in the anointing of corpses, to prefigure his role as healer and foretell of his death.

Both myrrh and frankincense have exceptional medicinal qualities, which would have made them a very useful and thoughtful gift for the Holy Family, said Anjanette DeCarlo, chief sustainability scientist for the U.S.-based Aromatic Plant Research Center.

"At that time, infant mortality was high," and frankincense and myrrh were "two of the most potent anti-microbial substances in the ancient medicine cabinet," DeCarlo told Catholic News Service in a video call from Vermont, where she teaches at St. Michael's College in Colchester.

"From a Christian perspective, he's the most important baby ever born and, of course, wouldn't you bring that baby something to ensure" he could stay healthy, she said.

What is not healthy, however, is the future of frankincense.

Highly sought after for its religious, medicinal and household purposes, it is one of the oldest traded commodities in the world, spanning at least 5,000 years.

An aromatic resin, frankincense is harvested from the "tears" that seep from cuts made to a variety of boswellia tree species, which grow in the harsh, dry climates of

Yemen and Oman in the Arabian Peninsula, of Eritrea, Ethiopia, Somalia and Sudan in East Africa, and in northwestern India.



Guy Erlich, an Israeli entrepreneur, taps a frankincense tree at a plantation in Kibbutz Almog in the West Bank in this Nov. 30, 2017, file photo. Conflict, climate change and poverty are driving the demise of the tree that produces frankincense resin. (CNS/Reuters/Ronen Zvulun)

These trees are in severe decline and one species in particular — the *boswellia papyrifera*, which grows in conflict-rife regions of Ethiopia and Sudan — risks going extinct in the next 50 years, said DeCarlo, who also heads the Save Frankincense project. A study published last year in the journal, *Nature Sustainability*, predicted frankincense resin production will be halved in the next 20 years.

The Catholic Church is a major consumer of frankincense since incense has an important place in its liturgies.

Dried gum grains are burned over hot coals in a censer or thurible to incense the altar, the book of Gospels, offertory gifts, sacred images and the people participating in the Mass, with the smoke symbolizing sanctification, purification and the prayers of the faithful rising up toward God.

Billowing upward, the smoke draws people's gaze with it to remind them of heaven, and the incense aroma is a reminder of the transcendence of the Mass.

Burning frankincense also activates different channels in the brain to alleviate anxiety or depression, according to researchers from Johns Hopkins University and the Hebrew University in Jerusalem.

"It promotes a feeling of connection and spiritual enlightenment," which is why burning frankincense has been an integral part of many different religious rites and rituals for millennia, said Stephen Johnson, an organismal biologist and frankincense researcher.

"Religions have a very important role to play" in helping not just to preserve, but to regenerate frankincense sources and support harvesters, he told CNS in a video call from Seattle.

"It is absolutely possible for us to take care of trees, take care of harvesters, take care of their communities and take care of ourselves," he said. "Everybody involved in the supply chain should benefit."

After years of working in Somalia and developing ethical and sustainable harvesting standards, Johnson said he decided to establish his own business and projects that show what regenerative supply chains look like.

Regeneration tries to leave ecosystems, communities and plants better off by using profits to support research, conservation and community development and by making sure harvesting communities have access to fair prices and greater opportunities, he said.

This new way of doing business has to happen now, DeCarlo said. "Ten years from now will be too late."

Most existing trees are "the last of their generation," with no young trees taking their place, she said, and over-tapping trees hurts their ability to regenerate, stay healthy and survive.



Conflicts and climate change worsen already harsh conditions, and local communities are under great pressure to clear the land to grow crops for survival, she added. Also, grazing cattle love to chew on the tender baby leaves of new growth.



Pope Francis uses incense as he celebrates Mass marking the feast of Our Lady of Guadalupe in St. Peter's Basilica at the Vatican in this Dec. 12, 2016, file photo. Conflict, climate change and poverty are driving the demise of the tree that produces frankincense resin. (CNS/Paul Haring)

Johnson and DeCarlo both insisted that frankincense buyers, including Catholic churches and the essential oil industry, must demand transparency and traceability

in the source of the resins and accountability in making sure harvesters are paid fairly.

"Today, we have the ability to go directly to the source, to talk to the actual harvesters and to employ technologies that allow us to track products all along the supply chain and make sure that that is all being done ethically" and in a way that allows the trees and the communities to flourish, Johnson said.

Without such controls the industry is "very open to corruption and/or decline," and "it's not helping the people on the ground, it's not helping the companies that want to do the right thing" and it doesn't help the consumers who "don't want to be killing trees or hurting communities or being complicit in something that isn't sustainable," DeCarlo said.

"We desperately need the Catholic Church to step in," she said, for example, by promoting regenerative supply chains and tree growing with programs to adopt trees and help struggling nurseries, even on a parish, school or individual level.

It is a direction that aligns with Pope Francis' call for caring for creation, said DeCarlo.

As a Catholic, she said, "I always felt that if he knew really what was happening with frankincense, he would get involved. That this is something so near and dear to us. The fact that it was brought to baby Jesus is not a small matter."

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