

# Climate change and rising seas threaten Egypt's breadbasket

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Farmland inundated with saltwater, gradually eats away the soil in the Mediterranean town of Mutubes, in Kafr el-Sheikh province, Egypt, Friday, Sept. 9, 2022. The impact of climate change has long been obvious to farmers, in the creeping salt that eats away roots and cakes their fields, turning them barren. Credit: AP Photo/Nariman El-Mofty

Sayed Abuel-Ezz has seen his crops wither from seawater before. As the Nile Delta farmer walks among his mango trees on his land not far from the Mediterranean Sea, he worries it will happen again despite spending the equivalent of tens of thousands of dollars to prevent it.

"If it gets higher, the trees will die," Abuel-Ezz said, looking towards the sea.

Here, the [impact of climate change](#) has long been obvious to farmers, in the creeping salt that eats away roots and cakes their fields, turning them barren. They pay a fortune to bring in truckloads of earth to try to raise their crops above the salt pushed into the soil by rising sea levels. But they say it is getting worse.

Bus drivers can see the changes too, how the sea more and more easily spills over onto the land. Now every winter, parts of the vital international highway running the length of Egypt's coast are flooded, say drivers on the route.

Situated on Egypt's northern coast on the Mediterranean, the Nile River Delta is one of the world's three most vulnerable hot-spots to [climate change](#) impacts, including rising sea levels, [according to a 2007 report by the United Nations-backed Intergovernmental Panel on Climate Change](#).

As Egypt hosts the U.N.'s global climate summit COP27 this month, the country's leaders have said the predicament of the Delta, known for millennia for its fertile soil, is foremost among their concerns. Residents are hoping for help to deal with the consequences of a warming planet.

The Delta covers roughly 240 square kilometers (93 square miles), starting just north of the capital of Cairo where the Nile River fans out. The rivers' branches created the rich, fertile land by depositing silt as they made their way to the sea. Since [ancient times](#), the area has been the

food basket of empires.

It's heavily populated, home to some 40% of Egypt's 104 million people and accounts for half of the country's economy, according to the U.N. food agency. Farms and fisheries along the two Nile branches, Rosetta in the west and Damietta in the east, help feed the country and provide products for export.

All of that is increasingly threatened by climate change and rising seas. A quarter of the Delta sits at or below [sea level](#). An increase between 0.5 and 1 meter (1.6 to 3.2 feet)—which could happen by 2100 in one of the U.N.-backed panel's worst case scenarios—will shift the coastline inward by several kilometers, submerging large areas and rendering more barren with salt. That's according to a recent report by an international group of scientists overseen by the Cyprus Institute's Climate and Atmosphere Research Center and the Max Planck Institute for Chemistry.

"This would imply severe challenges for coastal infrastructure and agriculture, and can lead to the salinization of coastal aquifers, including the densely populated and cultivated Nile Delta," said George Zittis, who co-authored the report.

The scenario judged to be more likely by the panel is that the sea will rise by 0.3-0.6 meters by 2100. That will still render thousands of acres unfit for farming or habitation.

The Associated Press spoke with more than three dozen farmers, fishermen and other residents in several villages and cities along the Mediterranean coast, the breadth of the Delta.

Spanning several generations, they said they have sensed climate change's effects for years, particularly in rising sea levels. They have

seen greater shore erosion and groundwater contaminated by salt. The saltwater intrudes as pressure grows from rising [sea water](#), and the counter-pressure from [fresh water](#) has lessened.

Saltwater intrusion is the most challenging threat to the Delta, said Mohamed Abdel Monem, a senior adviser on land and climate change with the U.N. Food and Agriculture Organization.

"This means less productivity and in many cases crops' death and therefore food insecurity," he said.

Hamdy Salah, a 26-year-old farmer outside the town of Rosetta in the western Delta, says planting practices have changed drastically. They once grew a variety: tomatoes, eggplants, pumpkins, and other vegetables. Now they grow mostly mango and citrus, which are less vulnerable to salt.

"We tried other crops like apple, but saltwater also killed its roots," he said.

Abuel-Ezz's family have farmed in Rosetta for generations, and he and his two brothers cultivate two farms of mango and citrus, five acres each.

A decade ago, they elevated their farmlands, one field by 1 meter (3.3 feet) and the second by 2 meters (6.6 feet), to combat rising [saline water](#) in the body of their farms. It cost them around 2 million pounds (\$101,700) by today's prices, said Sayed's brother, Saber Abuel-Ezz.



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The elevation, along with a government-built runoff system meant to reduce salt in the soil, bought them some time.

"It was costly but there was no alternative," said Sayed, a 36-year-old father of two.

Besides bringing in tons of earth, many cultivate plants in raised beds and use whatever natural or chemical fertilizers they can afford to

counteract the saline.

Without these measures, the land quickly turns desolate. On the other side of the river from Rosetta town, sheets of dried salt cover former farmland outside the town of Mutubas.

On one September afternoon, a half-dozen farmers sat near a machine pumping water from an irrigation canal onto raised beds in a mango farm in Mutubas. The trees have just started to blossom, next year could be their first harvest.

Ouf el-Zoughby, one of the farmers, said this is his third time trying to grow mangos. Past attempts have been thwarted by salt.

"You see the tree dying before your eyes," the 47-year-old farmer said, remembering how he had to pull the husks out one-by-one. His fields are within 3 kilometers (1.8 miles) of the Mediterranean.

This time, he's hoping the newly elevated farmlands and a government-built runoff system will help them survive, in addition to expensive chemical fertilizers. He's not sure what he will do if the crop fails again. He worries that without more government help, thousands could desert their farms.

The area has always been exposed to the nearby sea, but farmers say salinity was kept in check by supplies of fresh water and silt from the Nile. Even after the construction of [the Aswan High Dam](#) in over 50 years ago ended seasonal flooding, fresh water still reached the fields through canals. But even that has lessened, as the government has rationed agricultural water use, to account for the country's growing population. There's no longer enough to wash away the salt.

Further down the coast on the eastern side of the Delta, concrete barriers

have been put down just outside the city of Port Said, aiming to keep the rising waves back.

Abdel-Wahab Ramadan, a 61-year-old retired engineer, remembers spending summer vacations on white sand beaches here 30 years ago. Now, his grandchildren play next to the massive wave breakers in the muddy shallows.

"We are aware that this is necessary, but there are protection methods better than this ugly one," he said.

They are still just a half measure. They were not enough to stop waves from flooding beach-side restaurants and cafes in the town of Ras el-Bar in recent winters. Many now close during the winter months.

"Last year, we spent a week to repair the place, but unfortunately water flooded it again," said Abd Allah Gareib, who manages a café by the beach. It sustained water damage the past two years. This year, the sea already crossed the first two lines of wave breakers in October.

The barriers and runoff systems are part of government efforts to protect the Delta from climate change's effects.

Egypt's former Minister of Water Resources and Irrigation, Mohamed Abdel-Atty, said in January the government had installed concrete barriers on 120 kilometers (74 miles) along the Mediterranean coast, meant to shelter 17 million people. That is equivalent to about half the coastline of the Delta and the city of Alexandria. Egypt's entire Mediterranean coast stretches 990 kilometers (615 miles). Abdel-Atty said they were also working to build a warning system to alert any climatic changes like rises in sea levels.

At the same time, authorities are trying to put a stop to high-polluting

practices, like brick-making and an old farming custom, the burning of rice straw, which shrouds the Delta's skies with smoke every year after the harvest.

But there's understanding from Egyptians that this is a small step in tackling a global problem.

"Though Egypt contributes 0.6% of the global carbon dioxide emissions, it is one of the most vulnerable (countries) to the impacts of climate change, and the agriculture sector and food production are the most affected," said Abdel Monem, the FAO's expert.

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