

In Peru, drones used for agriculture, archeology

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A man prepares to launch a drone in Lima, Peru on July 10, 2013. The unmanned aircraft are equipped with a microcomputer, a GPS tracker, a compass, cameras and an altimeter, and can be easily programmed by using Google Maps to fly autonomously and return to base with vital data.

Drones are most often associated with assassinations in remote regions of Pakistan and Yemen but in Peru, unmanned aircraft are being used to monitor crops and study ancient ruins.

Forget Reapers and Predators—the drones used here are hand-held contraptions that look like they were assembled in a garage with gear from a hardware store.

They are equipped with a microcomputer, a GPS tracker, a compass, cameras and an altimeter, and can be easily programmed by using Google Maps to fly autonomously and return to base with vital data.

"These aircraft are small in size, are equipped with high-precision video or photo cameras and go virtually unnoticed in the sky," said Andres Flores, an electrical engineer in charge of the UAV program at Peru's Catholic University.

Flores heads a multidisciplinary team brainstorming the best ways to use drones for civilian purposes.

"Up to now we have managed to use them for agricultural purposes, where they gather information on the health of the plants, and in archeology, to better understand the characteristics of each site and their extensions," Flores said.

One UAV model built by Catholic University engineers is made with light balsa wood and carbon fiber. At a glance the devices look like souped-up hand-held glider.

One limitation is that these drones must fly below the clouds. If not their instruments, especially the cameras, could fail, said Aurelio Rodriguez, who is both an aerial model-maker and archeologist.

Some of the earliest human settlements in the Americas are found in Peru.



A man prepares to launch a drone in Lima, Peru on July 10, 2013. Drones are being used to help map the 1,300 year-old Moche civilization around San Idelfonso and San Jose del Moro, two sites on the Peruvian coast north of Lima.

There are thousands of archeological sites, many unexplored, dotting the Peruvian landscape, most of them pre-dating the Incas, a major civilization which was defeated by Spanish conquistadors in the 16th century.

Along the dry coastline, where the main construction material was adobe brick, whole societies flourished.

After centuries of abandon some of these ancient cities have deteriorated to the point that they are hard to distinguish in the sandy, hilly region.

Archeologist Luis Jaime Castillo is using drones to help map the 1,300 year-old Moche civilization around San Idelfonso and San Jose del

Moro, two sites on the Peruvian coast north of Lima.

"We can convert the images that the drones provide into topographical and photogrammetry data to build three-dimensional models," Castillo told AFP.

"By using the pictures taken by drones we can see walls, patios, the fabric of the city."

Separately, Hildo Loayza, a physicist with the Lima-based International Potato Center, is perfecting ways to apply drone technology to agriculture.

"The drones allow us to resolve problems objectively, while people do it subjectively," he told AFP.



A man prepares a drone before its launch in Lima, Peru on July 10, 2013. In agriculture, high-quality images allow experts to measure the amount of sunlight

the plants are getting, and study plant problems like stress from heat, drought or lack of nutrients,.

"In agriculture drones allow us to observe a larger cultivation area and estimate the health of the plants and the growth of the crops. The cameras aboard the drones provide us with 500 pieces of high-technology data, while with the human eye one can barely collect ten," Loayza said.

Precise, high-quality images allow experts to measure the amount of sunlight the plants are getting, and study plant problems like stress from heat, drought or lack of nutrients, he said.

Other potential civilian drone use, Flores said, includes closely observing areas of natural disasters or studying urban traffic patterns.

In the thick Amazon jungle, where access by ground is often extremely difficult, drones can be used to study wild animals. "Every time an animal goes by, it can snap a picture," said Flores.

There are no laws in Peru regulating the civilian use of drones, which allows advocates to push for all kinds of projects.

Their use in urban surveillance, however, could be seen as an invasion of privacy.

While experts are still dreaming up new ways to use the aircraft, security officials do use [drones](#) for military and police intelligence purposes, especially in Peru's rugged and remote valleys where coca—the source plant for cocaine—is grown.

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