African scientists try to resurrect research sidelined by COVID

As African nations begin easing the lockdown imposed to prevent the spread of the novel coronavirus, scientists are uncertain about the fate of their research projects.
A number of scientists in Uganda say they completely lost their research during that country's two-month lockdown, while others were unable to continue their experiments because they couldn't procure essential supplies, including test kits, and also lacked support staff to help carry out their work.

Arthur Tugume, professor of plant pathology and genetics at the Department of Plant Sciences, Microbiology and Biotechnology at Makerere University, said the crisis has delayed biotechnology research in the country and other scientific research on the continent. "Everything is at standstill," Tugume said. "The challenge of [obtaining] supplies is widespread."

Scientists expect the epidemic's impact on agricultural research will be prolonged and worsen as public funding for research is diverted to dealing with COVID-19.

"To abandon agricultural research is equivalent to signing an economic and population death warrant from which recovery will take several decades," Tugume warned.

Dr. Titus Alicai, a plant virologist who has spent the last eight years developing a genetically modified virus-resistant cassava variety at the National Crops Resources Research Institute [NaCRRI] at Namulonge, embodies this disappointment.

Since the lockdown, he's been unable to progress his research, which is at the regulatory stage, as he would have liked because his support staff can't make it to the institute.

"Immediately [after Museveni announced] the lockdown, many technicians and research assistants and other support staff at the institute who use public transport could no longer come to work," Alicai told the Alliance for Science.

"The casual laborers who come to the institute to help when we are planting field trials or selecting varieties, they too could no longer move," he said.

Alicai's research at NaCRRI is at the stage where scientists at the institution already know that the technology works — the new variety is virus-resistant. Now, they need to start selecting cultivars and assembling desirable varieties for further breeding. But the researcher cannot do all that work by himself, even when assisted by a few other officers who managed to commute to the institute in spite of the lockdown.

"After we have confirmed that the technology works, usually the next phase is to select germplasm and prepare for multiple site trials," Alicai said. "We have to plant multiple site trials because we want to be sure that the variety is high yielding and can be planted in various locations. Also, because we have to assess that the new variety is substantially like any other cassava, except that it is virus-resistant.

“This is a lot of work,” he continued. “Usually, we take one or two days to plant a field trial when we have the other support staff. Now we would need more than a week.”

Alicai, who has also been burdened by insufficient access to coronavirus test kits that would help staff safely return to work, said the disruption caused by the virus and lockdown “is causing different effects on the timelines of the products we are developing.”

Tugume said many scientists in Uganda and Africa were unable to continue their agricultural research because of disruptions in the global supply chain that have exacerbated the challenge of insufficient research supplies and other consumables on the continent.

“Uganda and generally Africa rely more than 95 percent on supplies and consumables from abroad, whose importation is not possible at this time,” said Tugume told the Alliance for Science. “Even if importation was possible, no one is available at the suppliers’ end and there is going to be less activity to supply the consumables. The supply chain is generally ‘frozen’ and cannot at the moment sustain any biotechnology research.

“Even if you wanted to plan a new project, you cannot do it now because of the uncertainty,” he continued. “The crisis has delayed biotechnology research in the country just like it has other scientific research on the continent. Some scientists have even lost their research.”

As an example, Tugume pointed to researchers in his department who completely lost biological experiments because Uganda’s lockdown was not announced in advance and they could not plan for a disruption in their work.

Worse still, Tugume said, funding organizations may redefine their priorities post-COVID-19 and allocate more of their resources to coronavirus-related research, which would stifle other research, including biotechnology.

“A great proportion of research in Uganda, just like studies for higher degrees, is privately funded,” Tugume said. “It is possible that if government of Uganda has money for anything called research, COVID-19 research would be priority, and perhaps this may be similar paradigm shift in funding organizations worldwide.”

The Ugandan government recently approved US$8 million for Makerere University for research in all disciplines, which Tugume characterized as “far too small. However, if invested correctly, meaningful strides are possible with these small research investments.”

Scientists in Uganda and Africa have been making strides in agricultural research, developing crop varieties that are higher yielding, disease-resistant and drought-tolerant.

For instance, scientists at the National Agricultural Research Laboratories (NARL) at Kawanda are concluding research for a GM banana that’s bio-fortified with pro-vitamin A, while other scientists in Africa have developed drought-tolerant maize varieties, including Water Efficient Maize for Africa. Alicai’s

cassava research was estimated to be ready for farmers in 2021 or 2022.

But COVID-19 and associated lockdowns across the continent are slowing all this research. It is expected governments will not relax measures until the pandemic has eased and cases have started dropping.

Tugume said Uganda and Africa can't afford to "completely abandon" agricultural research — even in these very trying times. "This could be deadly, only silently," he said.

"Our lives in Uganda and elsewhere hinge on a continuous supply of food supported by critical scientific and agricultural research systems," the professor said. "This is why food supply during COVID-19 pandemic in Uganda [and the globe] was left as most essential service, besides medical care.

"Continuous agricultural research ensures healthy and robust cropping systems avoiding crop and animal disease epidemics that can wipe our entire farms of crops and animals," he added.

As the lockdown eases, scientists will be looking to resume their research through the use of social distancing. "Everyone can create his or her physical limits in the laboratories," even when scientific research cannot be done in isolation, Tugume said.

This implies reducing the number of people in the lab by limiting access to key persons, removing technicians and making research scientists responsible for ensuring the sterility of the environment.

Tugume said scientists might also be facing higher costs to maintain their research, such as buying face masks or even purchasing bicycles for staff who cannot use public transport.

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