Create open data culture to feed hungry world, say experts

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Harvesting rice in Cambodia. Predictive farming based on open data will encourage collaboration to solve long-standing problems and feed communities, a debate on the future of agricultural research heard. Credit: Chor Sokunthea / World Bank. (CC BY-NC-ND 2.0)

The world's ability to feed its growing—and increasingly hungry—population will depend on a culture of openness in research and data sharing, a debate on the future of agricultural research heard.

Making agricultural data accessible is key to accelerating new discoveries and translating them into practice in the field, moderator Andy Robinson, managing director of publishing at the Center for Agriculture and Bioscience International (CABI, SciDev.Net's parent organization), told the meeting last week.

But agriculture is trailing behind its more open and accessible scientific counterparts, threatening the success of programs to reduce world hunger, the debate heard.

Tech challenge

This is partly due to the complexities inherent in agriculture, where issues as diverse as supply chain logistics, women's land rights, and plant genetics are interconnected.

"Agriculture's not lagging behind other fields so much as we could be doing more," Medha Devare, senior research fellow at the International Food Policy Research Institute (IFPRI) and a panelist during the discussion, tells SciDev.Net.

"The genetics and genomics fields, high energy physics, those are fields that have gone quite far ahead with making use of the [open data] technology, tools and capabilities that are currently available. They've done a better job. But there are many reasons for that."

Devare cites a cultural step-change that began in the 1980s in health and medical research, when public institutions in the US, such as the National Institutes of Health (NIH), mandated that research they funded be made openly available.

"I'm sure that at one point it was probably anathema, it was difficult for researchers to let go of their data," says Devare, who is also a module

leader at the CGIAR Platform for Big Data in Agriculture, which produces the Global Agricultural Research Data Innovation & Acceleration Network (GARDIAN).

"But, I think once they saw the benefits that were to be had through a humongous amount of data … and what you could do on the back of that with the tools that were quickly coming online, I think it was enough to change people's minds. And the funders didn't have to work that hard anymore, they didn't have to hold up those carrots or sticks quite that much, it became a culture."

By their nature, fundamental sciences such as physics or astronomy require practitioners to be very comfortable with data technology, says Devare. This can be missing in applied sciences such as agriculture, she argues, making data science training crucial at the outset of agricultural science studies.

Data hungry

Predictive farming based on open data will encourage collaboration to solve long-standing problems and feed communities, says Linet Juma, program officer at the Local Development Research Institute, a poverty think tank.

The lack of accessible data is preventing commercial enterprises from developing agricultural solutions, says Derek Scuffell, a data strategist at Knowmatics, an agricultural data firm.

"The day-to-day challenge in business is that we want to get to this point where we can use data to do some really cool stuff, make new services, get new services to growers, solve world problems and hopefully help the shareholder in some way," says Scuffell.

"But the data that enters into our pipelines enters at a low level of exploitation, we've got to do an awful lot of work to make it actually usable."

Devare does not believe that commercial interests are an impediment to openness in agricultural science. "[Companies are] very interested in seeing open agricultural research because they are looking for data just as much as the next person is," she says.

This raises questions around the monetisation of data generated by public institutions, says Devare.

Funders

The panel agreed on the need for cultural change in agricultural research, with many arguing the impetus needs to come from science research funders.

With funders "fundamentally" agreeing with programs such as Plan S—which requires that research funded by public grants be published in open access journals or platforms from 2021—open access is increasingly being seen as a norm, Martin Parr, head of open data at CABI, told the panel.

Yet, the ongoing focus on publishing research in so-called high value journals can be an obstacle, even when funders have signaled a change in what they will value and support, says Ashley Farley, knowledge and research services program officer at the Bill & Melinda Gates Foundation.

"A lot of this change is hard because we rely on faulty metrics, such as the impact factor [which quantifies the influence of an academic journal]," says Farley. "I think funders are working really hard and are

much more focussed on transitioning away from those kinds of metrics or perverse incentives, trying to have a big shift in behavior and cultural change."

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