ICT can take farming into the future

By Ian Theunissen   30 Nov 2015

Ahmed Ibrahim Wakea Allah is a farmer in Sudan. By taking part in an e-agriculture project, he quadrupled his wheat yield in just one year and went from making a loss of 8,000 Sudanese pounds in the 2013/14 season to a profit of 80,000 Sudanese pounds in 2014/15.

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E-agriculture is an emerging field that sees agricultural services, technology dissemination, information and communication delivered or enhanced through the Internet of Things (IoT). Agriculture is strategically important in supporting the livelihoods of the majority of the rural population in Africa and closer to home in South Africa. The growth of e-agriculture has the potential to accelerate agriculture and rural development, promote food security and reduce rural poverty in developing markets.

While farmers and their machinery are still key for the agricultural industry, technology is starting to play a more significant role in uplifting communities. This goes beyond basic computer training to using ICT to improve sustainability, efficiency and profitability of small-scale farming. ICT can facilitate relationship building with trusted suppliers of seeds and fertiliser; purchasing aggregation where multiple buyers can result in lower pricing; access to cultivation information and best practices; and an overall reduction in labour costs and wastage.

Satellite images

Ahmed experienced this first-hand when he took part in FieldLook Sudan. The project uses satellite imagery to improve water management and crop husbandry. Satellite images are used to provide information on crop growth, humidity and the nutrient needs of plants. Based on this, along with the current state of the farm, expected weather and the date of last irrigation, specialists send SMS messages to farmers' phones informing them of the best time to irrigate, when to apply fertiliser and other crop husbandry advice.

Ahmed and other farmers participating in the project now irrigate their crops more often but use less water. They have all seen increases in their crop yields averaging 60%, and their confidence in using ICTs continues to grow.

Beyond this project, the 2015 eLearning Africa Report shows that ICTs are having a significant impact on the productivity and efficiency of the continent's agriculture. A survey reports that 71% of farmers have used ICTs to improve their farming practices, with 90% saying ICTs are helping to improve food security and sustainability, as well as boost yields and improve income.

However, an important caveat is that 60% of the same farmers questioned feel they do not have sufficient access to ICTs. The main barriers preventing a greater uptake of e-agriculture include issues around connectivity, bandwidth and electricity supply, as well as the high cost of equipment and services and lack of government support.

Buy-in is needed

What is needed is the buy-in and partnering of the public and private sector to scale projects like FieldLook Sudan so that they impact the large proportion of farmers on the continent. In South Africa, the government needs to realise the importance of e-agriculture and the IoT in the agricultural sector and upskill emergent farmers.

Companies like Intel are already on board with various e-agriculture initiatives globally. In India, a joint collaboration between the Grameen Trust and Intel, called Grameen Intel Social Business, is addressing low agricultural output, which impacts poverty and food security. In this initiative, support for e-agricultural programmes includes productivity software, technological advice and training, community empowerment, ecosystem structures and building, training of entrepreneurs and capacity building for sustainable agriculture and rural development.

Closer to home, Ronin PFS is providing guidance and precision farming equipment in South Africa - just beginning to fill a gap in the ICT sector. The Bredasdorp Agri Mega Week also recently showcased just how ICT is being used in the agricultural space. Motorola promoted its IRRInet irrigation system, which makes use of a typical Motorola communication network for solenoid control. Sustainable food security was also a prominent topic, with e-agriculture touted as a solution to this issue.

More local innovation

Israel and New Zealand's involvement in modern farming techniques was apparent at the Agri Mega Week, but South Africa and particularly the Western Cape is beginning to understand the significance of IoT in agriculture. The hope is that there will be a lot more local innovation at the next Agri Mega Week. However, e-agriculture does tend to be overlooked as a viable and profitable sector and the result has been the development of in-house solutions as opposed to solutions coming from the ICT distribution sector. Intel is a great example of the success of providing solutions at the heart of the ICT sector.

The sector is, after all, at the centre of solutions like developing better weather mapping thanks to faster computers and more accurate data input; implementing wireless to help curb cable theft and making use of solar energy and battery storage to circumvent power shortages. These are all building blocks in constructing workable e-agriculture solutions.

Rectron distribution model

In this vein, the Rectron distribution model lends itself to e-agriculture with its green energy solutions, wireless and fixed line

communication networking, security surveillance, Intel Next Unit Computing (NUC), the cloud, industrial computing and embedded systems. In addition, premium 3D printing brand in the stable, MakerBot, has the potential to assist in the prototyping and manufacturing of unique and industry-specific parts and tools.

Rectron is certainly evolving, seeing the importance of IoT in paving the way for areas including green energy solutions, industrial computing and, of course, e-agriculture. Most importantly, new partnerships now include many more market verticals than before, all connected through the common gateway of IoT.

As agriculture makes up a large proportion of Africa's GDP, boosting agricultural growth and sustainability is a priority - and ICTs have the potential to support agricultural development in poor countries by functioning as innovative solutions to agricultural challenges. Agriculture might be a relatively new area for the ICT sector to think about, but it is an important one.

In fact, IoT and e-agriculture is no longer a luxury, but rather tantamount to every farmer's profitability and existence.

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