Digitising agriculture in Zambia through Ag-Data Hub

Data hub developed to spur agriculture growth

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THE onset of the rainy season, its duration and the quantity of rainfall expected are the three main concerns of Zambian farmers each year. However, these variables are not always easy to share by agricultural support services when not enough climate relevant data for agricultural activities is collected and recorded to give an accurate forecast.

Currently the main challenge concerning the collection and application of agricultural data is that Zambian institutions working in the areas of climate and agriculture development deal with incomplete information and also work in silos.

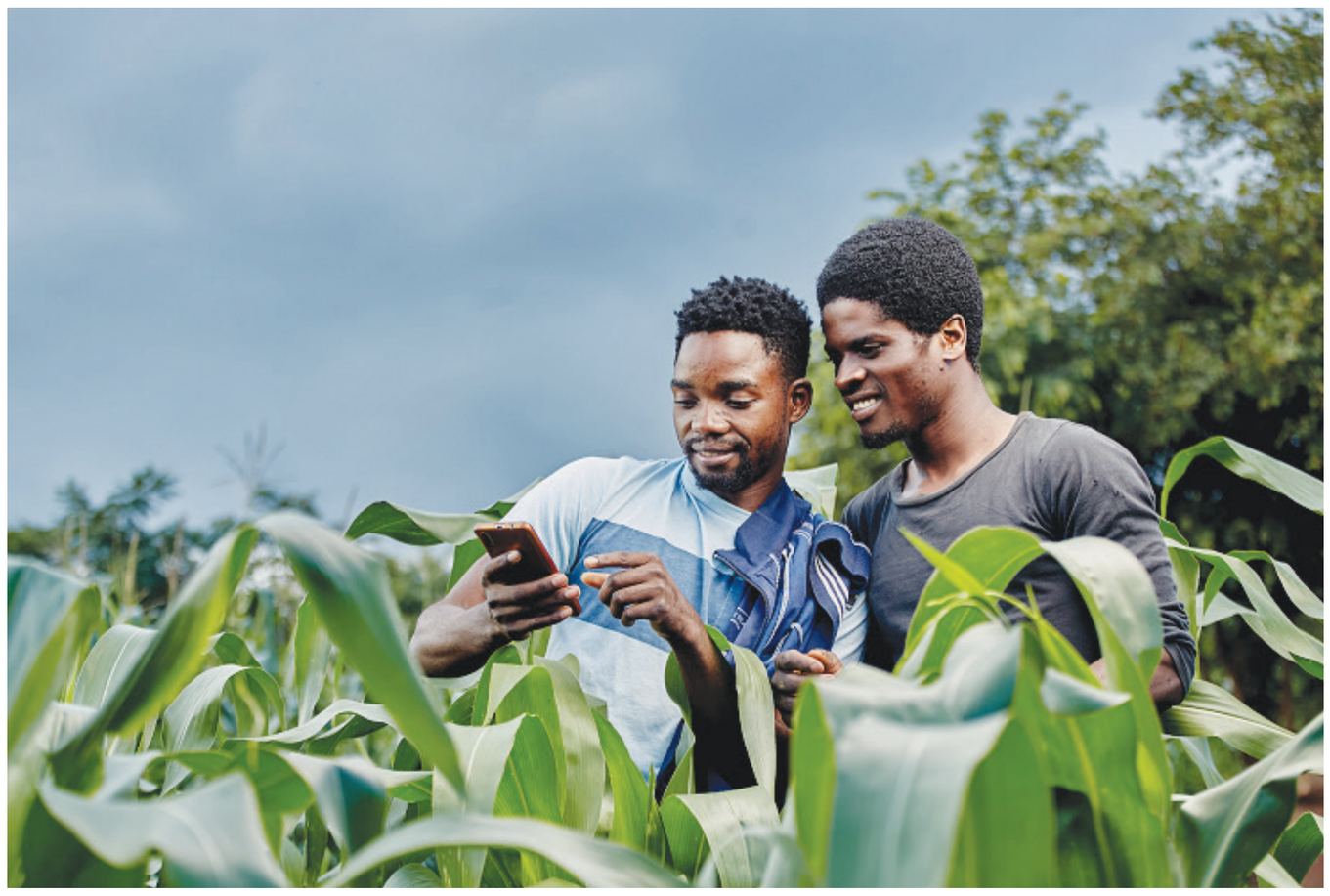
One way to solve this is through the establishment of an Ag-Data Hub that acts as a central platform for digitising and integrating agricultural data collected from key institutions to improve agro-advisory services to Zambian crop, livestock and fish farmers.

These include institutions such as the Zambia Meteorological Department (ZMD) in the Ministry of Green Economy, the Ministry of Agriculture, Department of Fisheries in the Ministry of Fisheries and Livestock, and the Disaster Management and Mitigation Unit (DMMU).

The concept of establishing a central Ag-Data Hub is being spearheaded through the World Bank-funded Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) project in Zambia, being implemented by the International Water Management Institute (IWMI) and partners, including the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Institute of Tropical Agriculture (IITA), WorldFish Center, the International Livestock Research Institute, the International Research Institute for Climate and Society (IRI) and the Government of Zambia.

The aim of the AICCRA project is to enhance knowledge, technologies and practices to build the resilience of agriculture and food systems in the face of changing climate.

Amos Ngwira is a systems agronomist with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), a non-profit, non-political organisation that conducts agricultural research for development in the dry lands of Asia and sub-Saharan Africa, which together with IWMI and other partners is co-facilitating the establishment of the Ag-Data Hub under AICCRA.



TWO young farmers view agriculture data in a maize field.

"We came up with the idea of this data hub to digitise the agricultural sector and to guide growth and engagement in agriculture initiatives in Zambia. Simultaneously, if we look at integrating data at national scale for various agricultural value chains, it will also help us drive decision support systems and tools that will generate agro-advisories for the intended users, the farmers, as well as input suppliers, offtakers and financial service providers," Dr Ngwira says.

At a consultative meeting held in February this year, partners for hosting and implementing the Ag-Data Hub were identified.

Stakeholders at the meeting recommended that the hub should be hosted by the SMART Zambia Institute, whose mandate is to manage and promote electronic government services and processes and to coordinate e-government and information and communication technology matters in public bodies.

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SMART Zambia assistant director in systems development, Kaluba Shiliya, says the Ag-Data Hub is an important data collection platform that would provide vital data for the Zambian farmer and the agriculture sector as a whole.

"If we have data that informs us, we can provide this information to our farmers to help them plan. For instance, we can advise them more accurately on the crops to plant depending on the predictions or forecasts we make based on the data collected. Having this data hub will play a major role in improving agriculture in Zambia," Mr Shiliya says.

The Ag-Data Hub would provide some general key benefits to Zambia such as providing agriculture with a shared and sovereign technological infrastructure to support the development of digital agriculture in Zambia.

It would also develop partnerships with effective workflows and use of resources among government ministries, development and private agencies.

Additionally, fair access to agricultural data to encourage the creation of climate information services for the agriculture sector would be provided, and an improvement in outreach of climate-informed agro-advisories to inform context-specific farm management decisions would be witnessed.

Principal agriculture officer in the Ministry of Agriculture, Morton Mwanza, says the ministry collects a lot of data, most of which is found in group focused survey reports.

"The data is on the different crops grown in the country by Zambian small-scale farmers. It also gives us the hectarage of each crop grown, recorded at district and provincial level, and the production for a particular year. Other key details such as soil types and information on pests and diseases are also collected and recorded," Mr Mwanza says.

He says this information is important for Zambian farmers as it gives them a forecast from climatic conditions and climatic trends and other related information, and is also helpful to the ministry for planning purposes.

The present lack of data integration by key institutions makes the process of accessing data cumbersome and time-consuming and further stresses the need for an Ag-Data Hub.

However, some specific challenges need to be addressed before the Ag-Data Hub can be successfully set up.

Creating buy-in and building capacity of national agencies to boost their technological readiness is one challenge. Another is the absence of governance policy legal frameworks and clearly established integrated systems.

Additionally, datasets are scattered across organisations and exist in non-standardised formats and platforms and there is also the lack of a data sharing policy across value chains.

Meteorologist in the Zambia Meteorological Department, Kenneth Sinachikupo, says the department has helpful climate data that, if loaded onto the data hub, would make it easier for farmers to access and improve their planning.

"We also have information shared in the form of forecasts and advisories. We give the first early warning to the country in the form of the seasonal weather forecast because this covers a six months outlook of what the weather will be in relation to global systems," Mr Sinachikupo explains.

The department is already making use of climate technologies such as the climate data management tool that helps the department process real data in real time.

Another is the map room that was developed in collaboration with International Research Institute for Climate and Society, which is a collection of maps and other figures used to monitor climate and societal conditions presently and in the recent past. The maps and figures can be manipulated and are linked to original data.

Even if an individual or entity is primarily interested in data rather than figures, it is a good place to see which datasets are particularly useful for monitoring current conditions and would assist research on climate vulnerabilities and food security.

Mr Sinachikupo says such data would be of additional value when made accessible in the proposed Ag-Data Hub.

Consultations among key stakeholders are ongoing to address all the challenges in the way of establishing the Ag-Data Hub. Once these obstacles are overcome, a data ecosystem that supports the blending of climate science and agriculture as the first of its kind in southern Africa will be created.

TEVETA ponders electric vehicle value chain skills

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ZAMBIA'S National Energy Policy highlights a hydro-power potential in excess of 6,000 megawatts (MW), out of which about 2,354MW has been developed. The country's increasing energy demand resulting from demographic and socio-economic factors creates energy supply pressure to meet the demand. In line with this, the Vision 2030 postulates increased alternative sources of energy such as energy storage, solar, biomass, to mention but a few.

One of the strategic skills to the electric vehicle battery manufacturing value chain is energy materials storage. Energy storage plays a vital role in reducing the gap between energy supply and demand. It enhances the reliability and performance of energy systems. This leads to saving of fuels and making cost-effective systems by storing the wastage of energy.

Lithium, cobalt and nickel are key materials for the manufacture of energy storage and power batteries, which store electrical energy by directly converting it to a chemical form. Examples are lead acid, nickel-cadmium, nickel-metal-hydride, lithium-ion, sodium-sulphur, metal-air and flow batteries.

Zambia has rich mineral resources and has unique advantages in the application of energy storage materials. With the rapid development of renewable energy and new energy vehicles around the world, formalised training programmes are critical in developing appropriate knowledge, skills and attitudes in manufacturing, recycling and maintaining batteries. The development of an energy storage materials training programme is among our efforts to actualise the bilateral agreement goals between Zambia and Democratic Republic of Congo (DRC) to manufacture electric vehicle batteries.

We have also developed different curricula feeding into the electric vehicle battery manufacturing value chain to ensure that a combination of relevant skills are churned out by the TEVET sector. These curricula include mechatronics, automatic electrical and electronics, manufacturing and automation, mechanical technology, machining, metal and non-metal mining and mechanical engineering for production. A number of TEVET institutions are implementing these curricula. These programmes are in line with the national agenda to add value to raw materials for the country to earn more from its natural resources.

Adding value to the battery minerals paves the way to a robust, resilient and inclusive growth pattern that creates jobs for millions of people. Young people whose capacity will be strengthened by the African Centre of Excellence on electrical batteries skills in Lubumbashi will be key players in the value chain. Electric battery vehicle manufacturing is in line with the ambitions of the Africa Mining Vision, adopted by heads of state at the February 2009 African Union summit. The vision accentuates how Africa would like to tackle the paradox of great mineral wealth existing side by side with pervasive poverty.

Over the years, Zambia and DRC played a key role in copper supply predominately used in electronics and wiring due to its high conductivity. The transition towards de-carbonisation and renewable energy has created a demand for electric vehicles and electric batteries. Zambia and DRC hold significant reserves of strategic minerals in the electric battery manufacturing value chain. These minerals are strategic in supporting a robust regional value chain for batteries, electric cars, and renewable energy.

The cooperation between Zambia and DRC towards electric battery making provides an opportunity to a robust, resilient and inclusive growth pattern that would create jobs for millions of young people. The bilateral cooperation includes exploring minerals rich in both countries, which are key raw materials in manufacturing of electric car batteries.

It is estimated that the electric battery will be the most consumed industrial product in the world by 2050. This will be mainly driven by the transformation of the automotive industry from being core mechanical engineering-specific to electronic subsystems. A combination of electric vehicle batteries and electric vehicles will generate about US$10 billion annually for the global economy. Zambia and DRC are tapping into that market by supplying value-added products to the electric vehicle manufacturing value chain.

This bilateral agreement signifies a huge milestone for both countries as this initiative provides a great opportunity to harness mineral resource wealth and foster the development of mineral-based industrialisation and value chains. TEVETA is among the players positioning the two countries strategically in the electric vehicle business by developing relevant skilled persons with enhanced employability in value of the manufacturing of these vehicles and their components.

Job creation and economic diversification are among the national goals for the country. Having a skilled workforce is one of the main factors in job creation and diversifying the economy. Government has identified technical education, vocational and entrepreneurship training (TEVET) among key sectors in developing relevant skills to increase citizens' economic participation. TEVET is essential for enhancing employability of citizens, increasing the productivity and sustainability of enterprises and broadening wealth creation opportunities across sectors.

We are constantly devising ways of enhancing youth employability both in the formal and informal sectors. Skills development is one of the major strategies to achieve sustainable youth employment. Globally, skills are widely documented as a very important tool for empowering youths for employability as well as entrepreneurship. Our vision is to ensure sustainable supply of a skilled labour force in line with national aspirations and development priority areas.

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