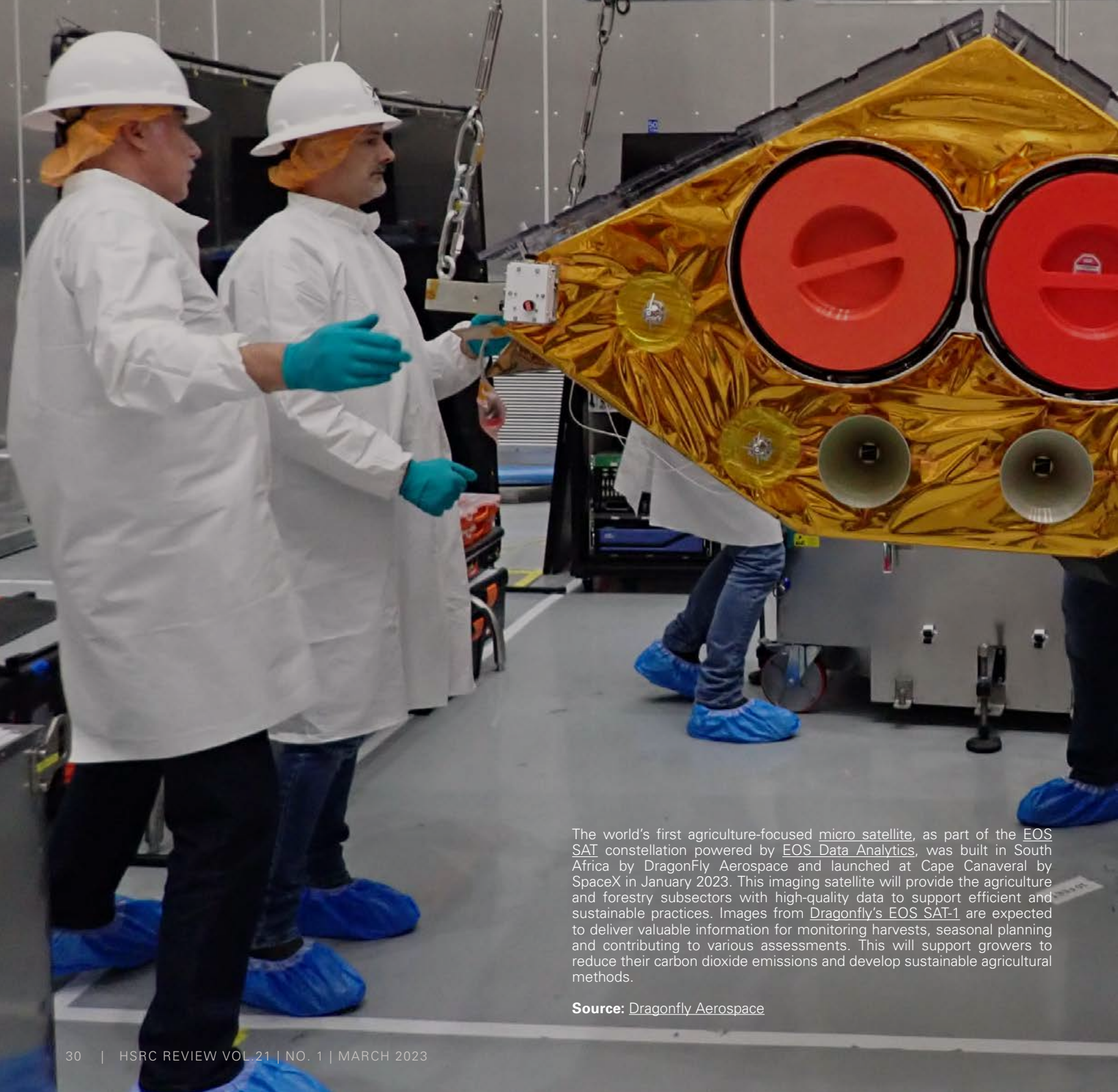


The importance of measuring agricultural business innovation in South Africa



The world's first agriculture-focused micro satellite, as part of the EOS SAI constellation powered by [EOS Data Analytics](#), was built in South Africa by DragonFly Aerospace and launched at Cape Canaveral by SpaceX in January 2023. This imaging satellite will provide the agriculture and forestry subsectors with high-quality data to support efficient and sustainable practices. Images from Dragonfly's EOS SAT-1 are expected to deliver valuable information for monitoring harvests, seasonal planning and contributing to various assessments. This will support growers to reduce their carbon dioxide emissions and develop sustainable agricultural methods.

Source: Dragonfly Aerospace

South Africa's agricultural sector plays an important role in ensuring food security and creating employment opportunities. However, to be productive, sustainable and competitive, it needs innovation that will reduce costs, increase yields and respond to environmental changes. **Dr Yasser Buchana** explains the importance of an HSRC survey of agricultural business innovation activities.



South Africa as a country and agriculture as a sector face multiple interconnected challenges. In the face of growing poverty over the last few years, South Africa's unemployment level has risen, economic growth has slowed to a record low and food security remains a pressing policy priority.

Even before the COVID-19 pandemic, agriculture was experiencing unprecedented and mounting challenges, including rising input costs, increased global competition and the manifestation of climate change through droughts and extreme weather events.

From a policy perspective, South Africa's agricultural sector is recognised for its important role in economic growth. This is due to its contribution to employment, potential to reduce inequality, and ability to foster biodiversity through the responsible stewardship of natural resources. The National Development Plan views agriculture as having strategic importance and the potential to create approximately one million jobs by 2030, which is a significant contribution to the country's overall employment targets.

South Africa's [Bio-economy Strategy](#), published by the Department of Science and Innovation (DSI), also identifies the strategic role of the agricultural economy. This includes the need to 'strengthen agricultural biosciences innovation to ensure food security, enhance nutrition and improve health'. The [2019 White Paper on Science, Technology and Innovation](#) targets agriculture as a sector that requires modernisation to support growth and development. At the same time, it acknowledges the complex relationships between innovation, sustaining employment, economic inclusion and achieving export competitiveness.

Growing a culture of innovation in agriculture

The [Oslo Manual 2018](#) defines innovation as 'a new or improved product or process (or a combination thereof) that differs significantly from a business's previous products or processes and that has been made available to potential users (a new product) or brought into use by the business (a new process)'. This means that innovation in the agricultural sector can take many forms, including the adoption of new technologies such as drones and robotics to improve the speed and accuracy of planting and harvesting, new irrigation methods that use sensor technologies to save water, the adoption of drought-resistant seeds, or new business processes that reduce environmental pollution.

These innovations can have significant benefits for agriculture by increasing yields, reducing cost, increasing productivity and profitability, and contributing to the sector's long-term sustainability.

The UN's [Food and Agriculture Organization](#) (FAO) maintains that, for agriculture and aquaculture to respond to future global challenges, innovation is needed to improve the efficiency of turning inputs into outputs, conserving scarce natural resources and reducing waste. Furthermore, these demands must be addressed in the context of increased global competition and climate change.

Addressing the limitations of available data and indicators

Without appropriate measurement that is contextually relevant to the challenges faced by the agricultural sector and the needs of farmers, it is difficult to determine how innovations contribute to the long-term sustainability of the agricultural sector.

In a policy context that values evidence-based decision-making, it is critical to measure the scale, nature and outcomes of innovation in South African agribusinesses. However, scholars and policymakers lack appropriate longitudinal data on agricultural business innovation, so they resort to estimation devices and proxies that almost certainly generate inconsistent outcomes.

Crude extrapolations present a data challenge that is not always immediately apparent. For example, policymakers often use statistical data on patent applications to stimulate investment in R&D or to inform policies on intellectual property rights. Although this approach may be useful, it potentially ignores the fundamental differences in technological capabilities of different types of businesses (large, medium and small), their access to financial and non-financial resources, or the different innovation characteristics of subsectors (agriculture, forestry and fisheries). Policies based on such extrapolations could be inadequate or fail to address the needs of agricultural stakeholders.

Data on innovation investments and activities, and factors that support or constrain innovation and its outcomes, have been difficult to obtain. This is because South Africa's main business innovation survey largely excludes the agricultural

sector. In addition, this type of information must be collected systematically using appropriate measurement frameworks. Most agricultural businesses do not publicly disclose this proprietary information in their annual reports in a way that is useful to researchers and policymakers.

South Africa's first agricultural business innovation survey

To address this evidence gap, the DSI commissioned a baseline survey in 2019 of agricultural business innovation in South Africa for the reference period 2016–2018. Conducted by the HSRC's Centre for Science, Technology and Innovation Indicators (CeSTII), the data provided a foundation to understand the innovation landscape of commercial agricultural businesses.

The results indicated that 62% of South African agribusinesses were innovation-active. This means they took some scientific, technological, organisational, financial or commercial steps during 2016–2018 towards implementing innovation. In total, 99.5% of these innovation-active firms introduced an innovation in their businesses or to markets in this period. More businesses implemented process innovation (47.9%) than other types of innovation such as product innovation (42.2%), organisational innovation (32.3%) and marketing innovation (31.4%).

The findings of the baseline Agricultural Business Innovation Survey (AgriBIS) 2016–2018 provide the foundation for a longitudinal data series on agricultural business innovation. Understanding the nature of innovation in the sector can inform the design of indicators to monitor progress towards policy goals.



Photo: Freepik

SA's second AgriBIS now underway

The AgriBIS is now in its second cycle, collecting data on agricultural innovation for the reference period 2019–2021, covering the agriculture (animal and crop farming), forestry and fisheries subsectors. The survey takes into consideration the contextual issues and characteristics of South African agriculture that distinguish it from other sectors of the economy, as well as from the agricultural sector in developed countries. The results of AgriBIS 2019–2021 will be published in 2023.

Innovation, through the adoption and diffusion of new technologies along every link of the value chain, can be a key enabler, changing and improving traditional methods of production. The second survey will deepen and expand our understanding of innovation in the farming, forestry and fisheries enterprises, and contribute to the development of a long-term trend analysis that will guide policymakers into the future.

About the second SA Agricultural Business Innovation Survey

Globally, governments are spearheading efforts to measure innovation in their economies. By working with businesses and innovators, they can figure out what policies are effective or where improvements are needed. This data is vital for a more innovative South Africa.

South Africa's second Agricultural Business Innovation Survey (AgriBIS), covering the period 2019–2021, will examine innovation activities in approximately 1,700 agricultural firms, from small to very large, and across a range of agricultural subsectors. In the same way that a company's financial statement is an essential tool for performance monitoring and planning, the second AgriBIS will deliver a national picture that shows what innovations are taking place, how they occur and what can be done to enhance innovation capacity in this vital sector.

To read South Africa's first Agricultural Business Innovation Survey 2016–2018, see <https://bit.ly/AgriBIS2016-18>.

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