

First survey to measure INNOVATION in South African agribusinesses

South Africa needs a productive and sustainable agricultural sector that contributes to the economy and ensures food security. The sector faces multiple interconnected challenges, exacerbated by the COVID-19 pandemic, and innovation is crucial for it to move forward.

The HSRC's Dr Yasser Buchana led a baseline [survey](#) to measure innovation in South African agribusinesses, and shares some main findings and insights with *Antoinette Oosthuizen*.

Agriculture plays a significant role in the economic and social development of South Africa. However, the sector's contribution to the national economy has decreased from 7.7% of the gross domestic product in 1971 to approximately 3% at present, according to [agricultural statistics](#).

Economists sometimes [define](#) the agricultural sector as 'traditional', with low productivity, even though it contributes to economic growth by providing food, labour, and capital. Statistics South Africa's [2017 Census of Commercial Agriculture](#) indicates that agriculture remains an important contributor to employment and livelihoods in rural areas.

"Even before the onset of the COVID-19 pandemic, the agricultural sector had to contend with rising input costs,

increased global competition and the impact of climate events in a context of high unemployment and slow economic growth. The sustainability of the agricultural sector is hanging in the balance, and the need to maintain food security has also become a pressing policy priority," says Dr Yasser Buchana, the HSRC's project lead for the [South African Agricultural Business Innovation Survey, 2016–2018](#).

Published in May 2021, this is one of many major surveys conducted by the HSRC's Centre for Science, Technology and Innovation on behalf of the Department of Science and Innovation (DSI). "Innovation is a critical strategic consideration for agribusinesses, sector support groups, government departments and several other actors in the agricultural system. Also, the [national business innovation](#)

Photo: Sara Price, Pixabay

surveys that our centre has been conducting for several years had not yet covered the agricultural sector," says Buchana.

The survey's main purpose was to understand patterns of innovation in agribusiness and factors that contribute to or hinder innovation. The report compares trends in the three main subsectors of agriculture, such as growing crops and raising livestock; forestry, such as tree plantations and forests; and fisheries, the farming of fish and other aquatic produce. It also provides an overview of the agricultural sector's contribution to the economy, how many people it employs and how critical it is for food security. This baseline data can now be used to inform targeted policy interventions.

Innovation activity

The findings showed that nearly two-thirds (62%) of South African agribusinesses undertook some form of innovation activity in 2016–2018.

Training (65.4%) and acquisition of new machinery and equipment (57.2%) and computer software (49.2%) were reported most frequently. However, design and engineering and the acquisition of agricultural land were not widely reported. The most used advanced technologies were precision agriculture technologies (49.2%), air and soil sensors (35.9%), and crop sensors (31.8%).

Innovation-active agribusinesses employed 63.6% of employees in South African agribusinesses, and two-thirds of these businesses were less than 20 years old. However, innovation-active businesses accounted for only 34.8% of the total agribusiness turnover of R219.5bn in 2018.

Differences between subsectors

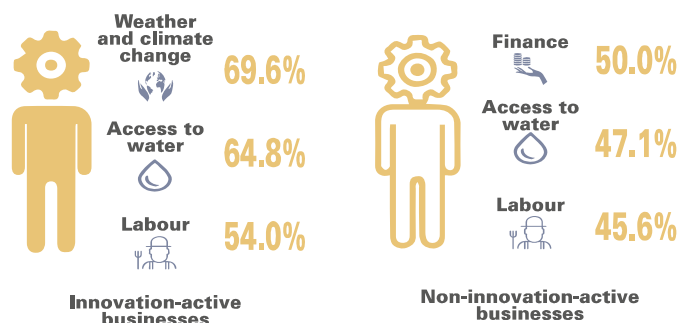
The report revealed significant differences between the subsectors. "The fisheries subsector was the most innovative compared with forestry and agriculture. The report also provides an in-depth profile of innovation in the fisheries and forestry subsectors to illustrate how such an analysis can refine support to policymaking," says Buchana.

Of the fisheries, 85.6% were innovation-active, reporting high levels of technological (product and process) and non-technological (organisational and marketing) innovation. They rated government support (79.8%) and agricultural policies and regulation (73.8%) as highly important to support and promote their innovation.

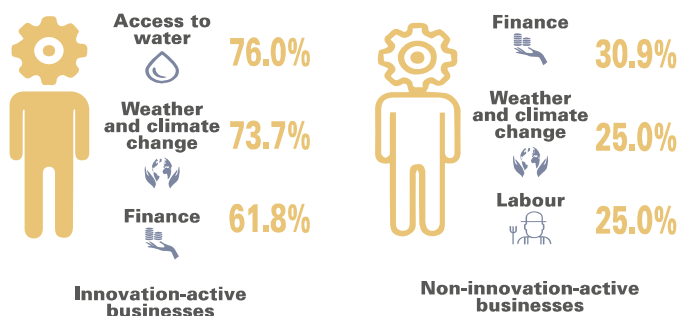
Examples of process innovation by fisheries include a large aquaculture business that introduced automated sorting machines, accurate data recording, and self-cleaning tanks using siphoning technology. Innovation aimed at mitigating climate factors included one company

Agribusiness innovation: Enablers, barriers and awareness of government support

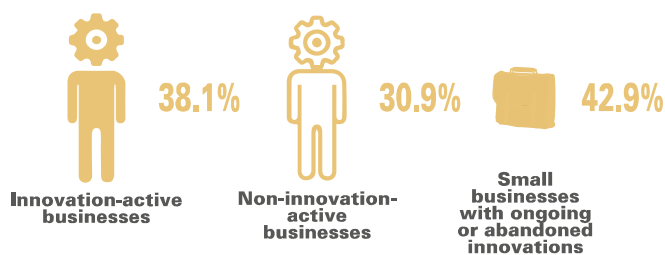
TOP 3 ENABLERS OF INNOVATION



TOP 3 BARRIERS OF INNOVATION



AWARENESS OF GOVERNMENT SUPPORT



implementing better filtration sequences and processes to guard against the negative effects of red tide, which had significantly damaged the industry in previous years. Another farmed an indigenous species in salt water, to reduce pressure on fresh water sources, and avoid the introduction of alien species.

In contrast, forestry businesses reported low levels of innovation activity. This sector was profiled as mature and 'low tech' with 42% of businesses older than 30 years, 61.3% older than 20, and a very high percentage (82.3%) not reporting innovation activity. Of the few that did innovate, less than 20% reported using sensors, drone technologies and 'smart' plant strategies.

A targeted approach

“The clear distinctions concerning the nature of the outcomes, challenges and enablers of innovation between the three subsectors mean that policy makers can’t apply a blanket approach in intervening to support innovation in the total sector,” says Buchana.

The findings also indicate a need for targeted funding instruments.

Innovation- and non-innovation-active agribusinesses reported finances and funding as among the most important barriers to innovation. Almost two-thirds were not aware of government funding support for innovation. Other important barriers related to resources and the environment, such as access to water and climate change. Institutional factors, such as policy and regulatory frameworks and government support, were also reported, as well as knowledge barriers such as labour and training. Market factors related to competition were not seen as highly important.

Enablers and barriers

- 69.6% of innovation-active agribusinesses rated weather and climate change as highly important in promoting innovation, followed by access to water (64.8%) and labour (54%). Non-innovation-active businesses most frequently rated access to finance as highly important (50.0%), followed by access to water (47.1%) and labour (45.6%).
- The top three highly important barriers to innovation reported by innovation-active agribusinesses were access to water (76.0%), weather and climate change (73.7%), and access to finance (61.8%). For non-innovation-active businesses, the top three barriers were access to finance (30.9%), weather and climate change (25.0%) and labour (25.0%).
- Innovation-active agribusinesses were slightly more likely to be aware of government support for innovation than those without innovation activity (38.1% vs. 30.9%), while 42.9% of smaller businesses with ongoing or abandoned innovations were aware of such support.

Buchana says the impact of many of these barriers can be mitigated and enablers promoted if the DSI coordinates and aligns its policy, strategies and interventions with other stakeholders in the agricultural system of innovation, related government departments, science councils, universities, and industry associations.

For example, the departments responsible for agriculture, forestry and fisheries can promote innovation in sectoral



Photo: Marlene Badenhorst, Pixabay



Photo: WhiskerFlowers, Pixabay

strategies and regulatory frameworks in collaboration with the DSI. Environment policy actors should work with agribusinesses on strategies to mitigate the impact of climate change, and those managing and providing education, training and skills could support specific agricultural subsectors.

The Department of Trade, Industry and Competition could coordinate with agricultural and innovation agencies to mitigate the impact of market barriers and promote competition and access to new markets.

A public resource

This report is a public document. “It is available not only to the DSI, but also to businesses and industry associations as a valuable resource that may support decisions around innovation investment,” says Buchana.

“For the first time in South Africa, agribusinesses can gauge and benchmark their innovation efforts against those of the entire sector. This may enable agribusinesses to innovate more to catch up where they are lacking, so they can compete nationally and internationally. Providing baseline data, the report may also help knowledge producers, including universities and private research institutions, to understand the agribusinesses’ innovation efforts so that they can collaborate.”

Contact: Dr Yasser Buchana, a postdoctoral fellow in the HSRC’s Centre for Science, Technology and Innovation
ybuchana@hsrc.ac.za

Author: Antoinette Oosthuizen, a science writer in the HSRC’s Impact Centre
aoosthuizen@hsrc.ac.za