

# Data drives strategic dialogue around innovation in agriculture

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South Africa's first survey on innovation in agriculture found diverse patterns of innovation activity across the sector. At a recent HSRC policy forum, the findings catalysed rich debate among actors from universities, farming councils and government departments about how to foster and direct innovation. Speakers identified the need for better data, a more coordinated policy approach regarding innovation, and incentives for technologies that promote sustainability and benefit small scale farmers.

By **Andrea Teagle**

The agriculture and manufacturing sectors are cornerstones of a more inclusive, equitable and resilient future South Africa. Yet, instead of growing over time and absorbing unemployment, both sectors are contracting. In 2021, agriculture contributed just 3% of GDP, down from 7.7% [fifty years ago](#).

Innovation is critical for the sector to develop and to be able to withstand external shocks like COVID-19. "Some people talk about technological innovation, social innovation, etc. I put everything under one umbrella, as a complex process of continuous learning," said Judith-Ann Francis, an independent policy advisor on innovation in agriculture and the keynote speaker at a recent HSRC policy forum on the topic.

How can the agricultural sector and public and private stakeholders foster effective innovation? First, we need data on the kinds of innovation that are currently taking place in the sector. Then, stakeholders need to agree on what problems we want agriculture to prioritise, so that we can devise targeted funding instruments for innovation activities that are most likely to solve them.

The [White Paper on Science, Technology and Innovation](#) aims to achieve inclusive development and food security, said Dr Glenda Kruss, who heads the HSRC's Centre for Science, Technology and Innovation Indicators (CeSTII). She asked if current innovation activities in the agricultural sector contributed towards these goals and, if not, where the obstacles lay.

## Base of innovation

CeSTII researchers, including Kruss, recently conducted the first survey to understand innovation in the agricultural sector in South Africa, on behalf of the Department of Science and Innovation. [The South African Agricultural Business Innovation Survey, 2016–2018](#), looked at innovation patterns in forestry, fisheries and farming with livestock and crops. The indicators were based on standard international methods – to enable comparison with other countries – but were adapted for the local context. In total, almost two-thirds (62%) of agribusinesses undertook some form of innovation activity between 2016 and 2018, according to the survey; however, the type and amount differed within and between sub-sectors. For example, Kruss said, 76% of crop farmers are innovating, but among livestock farmers, who constitute a smaller percentage of agricultural farmers, this figure is just 47%. Fisheries reported the highest levels of both technological and non-technological innovation, while the survey revealed little innovation activity in forestry. (See this [Review feature article](#) for a breakdown of the findings.)

Although the report suggests a degree of innovation, it also found that the sector faced several stumbling blocks. According to the agricultural stakeholders who spoke at the conference, many issues are related to a lack of coordination in policy implementation among different government departments, which leads to conflicting policy goals.

"One of the big issues we have is that sometimes there are not proper synergies between the [agricultural] trade mandate and what is good for producers," said Marinda Visser of Grain SA, adding that what is good for the farmer is not always aligned with what is important for trade and for the country.

## Inclusive innovation?

What counts as innovation? It might be an innovative technology, or it might be an innovative process. If we are interested in product innovation, Kruss said, we might look at the novelty of our innovation. How far is it from the technology frontier? Of the 42% of agribusinesses that reported engaging in product innovation, 90% reported innovating to significantly improve existing goods, while a much lower 54% innovated to create entirely new goods.

In the future, Kruss and her team are also interested in assessing whether innovation activities are fostering inclusive development. They propose that one way of doing this might be to break the concept of inclusivity down into three components: social inclusiveness referring to inclusion of marginalised communities; territorial inclusivity considering whether innovation extends to marginalised areas, isolated rural areas, etc; and industrial inclusiveness referring to whether we are modernising sectors and including SMEs.

Although small-scale farmers are often celebrated as critical to sustainability and food security, the benefits of most technologies were enjoyed by large-scale commercial farmers. For instance, many farmers in the fruit and wine sectors believed that the fourth industrial revolution posed a threat to the competitiveness of smaller players, said Dr Albert Strever, an agri-informatics expert. However, technologies like blockchain could help with issues such as traceability – making the supply chain transparent – which could [benefit small-scale farmers](#).

“We have to find mechanisms of bringing in new entrants and ... developing farmers into the main value chains,” said Dr John Purchase, CEO of the Agricultural Business Chamber. The speakers highlighted the need for data on innovation activities among small-scale farmers. (While small-scale commercial farmers were included in the current survey, it did not capture inputs by subsistence and emerging small-scale farmers.)

## Policy coherence and holistic solutions

Innovation could be enabled by aligning the innovation agendas of different stakeholders, including government departments, academic institutions and industry associations. “I think there is a need for a much more coordinated approach from the government in respect of innovation in agriculture,” said intellectual property and innovation expert Dr McLean Sibanda.

In addition to funding, the government should coordinate non-financial support, such as negotiating licensing and navigating intellectual property rights, Sibanda said. Visser said that the grain industry had agreed upon a common agenda with policymakers. This included climate resilience, biosecurity, digital agriculture, and investments in building local capacity. Growing local capacity requires partnerships between stakeholders and across disciplines.

Speakers also emphasised the importance of scaling up local innovations to reach other African countries and to make room for African innovations to find their way here via the [African Continental Free Trade Area](#) agreement.

## Sustainability

What about sustainability in the sector? “There is a commitment to a circular economy, which has zero waste,” Kruss said. “It leads to resource efficiency but, importantly, means that we might have to have major changes to our methods of production and consumption. So, our indicators need to be assessing that in some way.”

Agriculture also has an opportunity to lead societal shifts towards greener, more sustainable living. For example, energy is a major obstacle in agriculture, but it also presents an opportunity for growth. In addition to aiming to become carbon neutral, agribusinesses could position themselves as future energy producers for urban sectors, Strever said. “I think agri-photovoltaics [the simultaneous use of land for food production and for solar power generation] ... has not reached the potential it could in Africa, but specifically also not in South Africa.”

Finally, Strever noted the importance of innovations that improve efficiency in agricultural businesses. “So many producers tell me that they will integrate blockchain and all kinds of synergistic technologies if it improves the baseline and helps them survive.”

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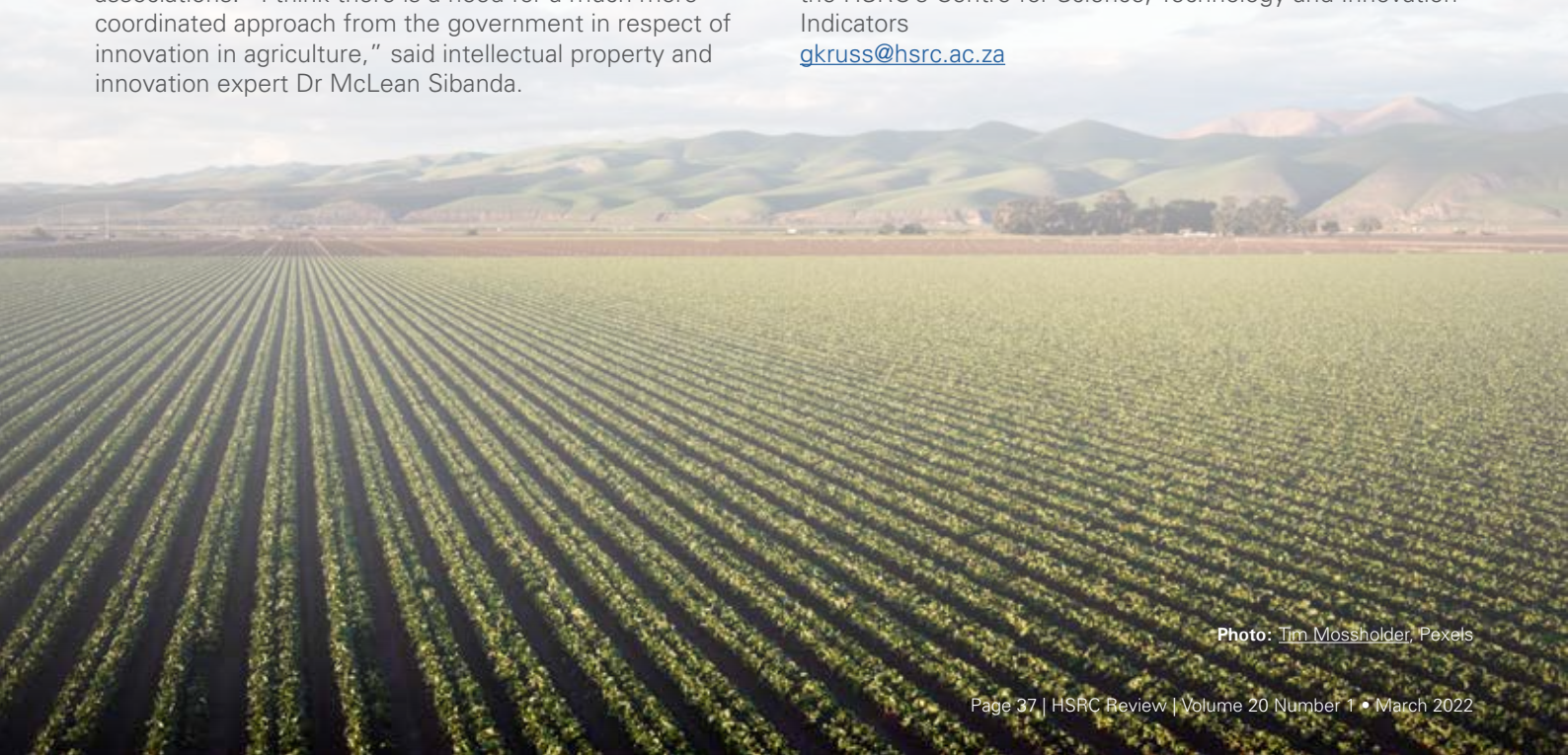


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