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| MEMORANDUM FROM THE PARLIAMENTARY OFFICE |

**NATIONAL ASSEMBLY**

**FOR WRITTEN REPLY**

**QUESTION 1265**

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**INTERNAL QUESTION PAPER NO 13 OF 2022**

**Mr S L Ngcobo (IFP) to ask the Minister of Higher Education, Science and Innovation:**

(a) What contribution had the private sector made towards innovation in the Republic in the past two years, (b) what projects are the most noteworthy in this regard, (c) in which sectors of the economy has the private sector contribution been instrumental and (d) how have the specified projects advanced the development agenda of the Republic?

**NW1521E**

**REPLY:**

The answer is based on some of the DSI’s initiatives and surveys namely: Sector Innovation Fund (SIF), Agricultural Bio-economy Innovation Partnership Programme (ABIPP), R&D Tax Incentive, Business Innovation Survey (2014-2016) and Agricultural Business Innovation Survey (2016-2018).

**Sector Innovation Fund (SIF) and Agriculture Bioeconomy Innovation Partnership Programme (ABIPP)**

(a) What contribution had the private sector made towards innovation in the Republic in the past two years,

In terms of the Sector Innovation Fund (SIF) programme which is one of the DSI’s initiatives aimed at encouraging the private sector to increase its investment into research, development and innovation. The pilot phase of the SIF programme was implemented in 2014/15, with the second 4-year phase commencing in 2018/19, and the supported sectors were selected through calls for proposals processes.

The SIF programme targets organized industry associations, which the DSI partners with to implement RDI programmes that are aimed at meeting the industries’ competitiveness challenges. These challenges range from the need to develop high-end skills; to the need to identify alternative pest and disease control methods and mechanisms to retain (or develop) new export markets; to working towards a circular economy; to improving operational efficiencies, to dealing with global change and other environmental issues. The partnerships are co-funding arrangements in which the industry partners match the DSI’s funding contribution into each SIF. Total investment by DSI is about R182 million, from 2014 to last financial year and from Industry is about R108million.

The previous financial year, the DST has implemented six multi-stakeholder programmes in the agriculture sector, through its instrument, the Agriculture Bioeconomy Innovation Partnership Programme (ABIPP), and in partnership with the private sector. A total of R73, 375 728.00 has been leveraged from private sector and includes funding from the Grains and oilseeds industries (Grain SA, Winter cereal trust, South African Cultivar and Technology Agency, Maize Trust, Sasol Trust, Oil and Protein Seed Development Trust (OPDT)), Red Meat (RMIRA), and Technology Innovation Agency.  For all other partners there are in-kind contributions by virtue of involvement in other aspects of the project, inputs, knowledge transfer etc

 (b) What projects are the most noteworthy in this regard,

There are more than 100 projects across the different SIF programmes, but the outputs and outcomes of a number of these have been instrumental in contributing to the relevant sectors maintaining or improving their competitiveness. Examples include an online phytosanitary certification tool that has enabled the citrus and other horticultural sectors to access and retain export markets; alternative pest and disease control mechanisms that allowed the citrus industry to overcome the EU’s Citrus Black Spot barriers to entry; new packaging and transportation protocols and methodologies that contributed to significant cost savings; plantation management systems that assisted emerging forestry growers and processers to improve their operational efficiencies.

The following is the partnership and the programme under ABIPP:

1. **The Strategic Innovation Partnership for Grain and Oilseeds** which is a partnership between Grain South Africa (Grain SA), DSI and TIA. They are many government and industry partners in the projects and many co-funders involved. Of the four projects currently under implementation, the Wheat Breeding Platform aims to provide industry with access to improved genetics and higher-yielding, locally adapted wheat germplasm to enhance the sustainability of the local wheat industry and improve South Africa’s self-sufficiency. In the previous financial year, 200 genotypes were identified for distribution and were sent to the collaborating programmes of private companies Syngenta, Corteva and Agricultural Research Council (ARC)-Small Grains. Two cultivars were selected by industry for commercialization. Of these two, one has been submitted for registration with the Plant Breeder’s Rights Act.
2. **Soybean Food and Nutrition Development Programme**. The programme is a partnership between TIA and Oil and Protein Seeds Trust (OPDT). The projects include the assistance of black emerging farmers to plant soybean and grow into commercial farmers (growing from subsistence, emerging, small scale and commercial).
3. **Red Meat Sustainability Programme**. The programme is a partnership between TIA and Red Meat Industry Research Association (RMIRA) with the aim of supporting innovations in the red meat industry to contribute to the development of the industry. Under this programme, two projects are currently underway; the “Precision farming of feedlot cattle to enhance animal welfare, health and production” and the “Evaluation of small holder pig production systems in the Cape Metropole District of the Western Cape province in South Africa”.

 (c) In which sectors of the economy has the private sector contribution been instrumental

There have been seven SIF programmes in the following sectors: horticulture (post-harvest innovation), citrus, minerals processing, forestry, paper manufacturing, wine and sugar milling. And there are six ABIPP partnership programmes currently contribute in the following agricultural sectors: 1) Wheat, 2) Maize, 3) Soybean, 4) Cotton, 5) Red meat, 6) Potato, 7) Canola, and 8) Cassava

(d) How have the specified projects advanced the development agenda of the Republic

The SIF programme has contributed to high end, industry-relevant, skills development, through supporting at least 438 students and interns from its inception up to the end of December 2021, with just under 8% of these having already become employed as a result of the support. There have also been at least 66 knowledge products that have been produced, at least half of which has been transferred to industry partners, including small or emerging players. About 51% of the students supported are female (with about 27% being Black females), and about 55% of the students are Black. The DSI’s investments also had a huge leveraging impact as it attracted more funding from the private sector.

With regards to wheat, our local sector produces only approximately half of the wheat that South Africans consume and the remaining gap is met through imports.  Initiatives to increase production will therefore reduce the balance of payments for wheat imports.

**R&D Tax Incentive**

The R&D tax incentive does not address “innovation” *per se*, but is rather focused on systematic investigative or systematic experimental activities of which the results are uncertain, which activities may be a smaller part of “innovation”. Data is not captured by the DSI on annual contributions of the private sector to R&D, but rather on expected costs of proposed projects over the life of such projects. Also, due to secrecy restrictions of the Income Tax Act, no information on particular projects can be provided.

What is available are values for **tax revenue foregone** due to participation of taxpayers in the R&D tax incentive (as published in the Budget Review of 2022) which indicated the following impact: Tax revenue foregone for 2016/17 – R234 million; 2017/18 – R266 million, 2018/19 – R279 million and 2019/20 – R199 million.

The above can be translated to the R&D tax expenditure of tax payers that participated in the programme during the particular years.

**R&D supported by section 11D R&D tax incentive**

2016/17 – R1,68 billion, 2017/18 – R1,9 billion, 2018/19 – R2 billion and 2019/20 – R1,42 billion

The budget review also indicated that roughly half of the total R&D tax expenditure has supported the manufacturing sector over this period.

The large share of support directed towards manufacturing, and to a lesser extent to the agricultural sector, shows that this incentive encourages R&D within sectors that are important for creating jobs.

An average of 291 taxpayers received the benefit of the R&D tax incentive for the first three fiscal years presented (the latest year has a low level of assessment). Of these, 101 taxpayers are from the manufacturing sector; 68 from the financial intermediation, insurance, real estate and business services sector; and 50 from the agricultural sector.

**Business Innovation Survey (2014-2016)**

The Business Innovation Survey provides key indicators on business sector innovation performance and the understanding of the business sector’s perceptions of the barriers to innovation, which provides essential evidence to promote innovation, going forward. The measurement of innovation is an invaluable opportunity to pause and reflect on where South Africa’s innovation strengths and challenges lie. The BIS indicators are considered among the best for measuring innovation processes, as they directly ask firms, the ‘performers’ of innovation, whether they engage in innovation activities (e.g. by performing R&D, buying advanced machinery used for, or training personnel involved in, the development of new products or processes), whether they introduce specific innovations (product, process, marketing or organizational).

**SUMMARY OF KEY FINDINGS**

**Innovation was pervasive across all sectors, but especially in engineering and tech, manufacturing, and trade.**

* More than two thirds (69.9%) of South African businesses were innovation-active. They took some scientific, technological, organisational, financial, or commercial steps, duringn2014-2016, towards the implementation of an innovation.
* Innovative South African businesses engaged in the four types of innovation measured in almost equal shares: product innovation (48.2%), organisational innovation (42.0%), marketing innovation (41.7%), and process innovation (34.6%).
* The engineering and tech, manufacturing, and trade sectors reported the greatest concentrations of innovation in 2014-2016.

**South African businesses invested in innovation activities that helped them—and their workforces—to prepare for technological and organisational change.**

* South African businesses geared for technological change by training their workforces and investing in new information technology. The business innovation activities reported by the largest share of companies were training (59.3%), acquisition of computer software (58.3%), and acquisition of computer hardware (57.2%).
* For both the industrial and services sectors, the biggest-ticket innovation expenditure item during 2014-2016 was the acquisition of machinery and equipment.

**More innovation-active South African businesses accessed national and global markets than their counterparts with no innovation activity.**

* Businesses with innovation activity were more likely to have sold their goods and services on national markets (58.1%), when compared to non-innovation-active businesses (37.7%). More non-innovation active firms accessed selected provincial markets (57.4%) than any other market.
* In addition, more innovation-active businesses accessed global markets, including
* Markets in the rest of Africa, Europe, Asia, and other countries, than non-innovation-active businesses.

**Quality improvement was the top-rated innovation outcome for innovation-active businesses.**

* Improved quality of goods and services was considered by 38.0% of product and process innovators as a highly successful outcome of innovation, followed by increased revenue (31.8%) and improved profit margins (30.9%). Similarly, for 49.5% of organisational innovators, improved quality was the most highly rated innovation outcome.
* Improved health and safety (27.0%) or reduction in environmental impacts (23.3%) were reported by a significant number of product and process innovators when compared to financial or quality outcomes.
* Entering new export markets or increased export market share as a highly successful innovation outcome was reported by only 7.5% of product and process innovators.

**innovation was not a widely connected phenomenon.**

* Only about one-fifth (20.8%) of innovation-active businesses reported collaboration activities as part of the development of their innovations. The five most widely reported reasons to collaborate were accessing information, accessing R&D, accessing expertise, cost sharing, and accessing new markets.
* 2014-2016: private research institutes and government research institutes were sources of information for only 7.8% and 7.4% of innovative businesses respectively, while universities and higher education institutions were used as a source of information by only 2.8% of innovative businesses.

**major obstacles to innovation included mostly financial but also some market factors.**

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* Barriers that innovation-active businesses identified as most important concerned financial and market factors. Eight widely reported obstacles included lack of funds from within
* the business or business group (31.5%) or from external sources (25.0%); the excessive cost of innovation (22.5%); lack of credit or private equity (24.8%); difficulty in accessing government grants (21.5%); uncertainty about demand for innovations (19.3); market competition (16.4%); and lack of customer demand (8.6%).
* For non-innovation-active businesses, the most widely reported barrier to innovation was a lack of demand for innovations (20%).

**Agricultural Business Innovation Survey (2016-2018)**

Agricultural Business Innovation survey measures the scale, nature and outcomes of innovation in South African agribusinesses in order to provide evidence required to inform decision-making and policy. The results of Agricultural Business Innovation Survey can aid policy actors in improving existing instruments and funding mechanisms to enhance current and desired forms of innovation in South African agribusinesses as a whole, and within specific subsectors.

**SUMMARY OF KEY FINDINGS**

* 1. During the period 2016 to 2018, 62.0% South African agricultural enterprises were innovation active. These are enterprises that engaged in any form of innovation activity. So, about 38.0% of the enterprises did not engage in any innovation activity. Innovation activities are many and can comprise combinations of
	2. The data shows that the agricultural sector is changing and firms are investing in a wide range of innovation activities to help them adapt and prepare for the future. The survey results indicate that South African agricultural enterprises were most likely to be investing in training (65.4%) their employees to help them adapt to new processes and technologies that are transforming the agricultural sector. Enterprises were also investing in the acquisition of machinery and equipment (57.2%), as well as acquisition of computer software (49.2%). In addition, a significant proportion of agricultural firms were investing in intra-mural R&D (48%) and extramural R&D (44%).
	3. Most technological innovations in agricultural enterprises are incremental and new to the firm or market. The data indicates that almost 50% of all product innovators developed products that were new to their firms, followed by 49.5% of product innovators who indicated that they developed innovations that were new to the market, and a smaller proportion, 13.7%, reported innovations that were new to the world.
	4. Firms were provided with a list of possible answers to indicate the outcomes they derived from their innovations. These were grouped into categories and included some shorter and longer-term effects. There were multiple outcomes of innovation, and these reflect the different types of innovations implemented by firms. The top three outcomes reported as highly successful by the highest proportion of innovation-active enterprises were improvement in soil fertility (23.1%), followed by increased variety of crops/species/animals (20.2%), followed by development of new intellectual property (IP) (18.4%).
	5. The share of businesses that were innovation-active in the farming and fisheries sub-sectors was larger than it was for the entire agricultural sector, while a smaller share of forestry businesses was innovation-active than the entire agricultural sector, with process innovation more frequently reported by those who do innovate.