

# **NACI ROUNDTABLE DISCUSSION:** PRELIMINARY FINDINGS ON THE DESIGN AND IMPLEMENTATION EVALUATION OF THE DST SECTOR INNOVATION FUND PROGRAMME



**DST GONDWANALAND BOARDROOM**  
30 NOVEMBER 2018



**science & innovation**

Department:  
Science and Innovation  
REPUBLIC OF SOUTH AFRICA

**NACi**  
NATIONAL ADVISORY COUNCIL ON INNOVATION



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# PROCEEDINGS

## 1 WELCOME AND INTRODUCTION:

### Dr Mlungisi Cele, NACI Acting CEO

Dr Cele thanked everyone present. The first part of the programme would share information about the DST Sector Innovation Fund (SIF) evaluation and the second part focus on feedback and recommendations, with a view to integrate feedback and recommendations into the evaluation. The panel would conduct both a retrospective analysis and adopt a futuristic perspective to clarify the way forward.

## 2 PRESENTATION ON THE SIF EVALUATION:

### Dr Petrus Letaba, Senior Specialist, NACI

Dr Letaba provided background information and an introduction to the evaluation, addressing its objectives, the methodology adopted and findings. Reference was made to local and international benchmarking. The emphasis was on stakeholder feedback to further refine the evaluation and identify inaccuracies.

Reference was made to the evaluation framework developed by the Department of Performance Management and Evaluation (DPME), particularly the logic of the programme and implementation activities and structures. The purpose was a sound design and implementation evaluation of SIF. SIF was established in 2013 by the Department of Science and Technology (DST) to increase competitiveness of industrial sectors, increase private sector research and development (R&D) expenditure, expand DST and private sector integration and innovate or create new sectors.

Sectors were described in a table. Slide 6 provides a summarised supported industrial sectors.

The evaluation:

- ▶ Examined the SIF programme's theory of change (logic model) or to derive one if it does not exist.
- ▶ Determined the relevance and overlap of the SIF programme with the government's other private sector innovation funds.
- ▶ Measured early evidence of SIF programme impact as it is too soon for an impact evaluation.
- ▶ Recommended SIF programme improvements in design, implementation or impact.

The methodology covered document review, benchmarking, conducting surveys and interviews with key respondents, and analysing findings (slide 8). The roundtable was to work through and refine recommendations in consultation with stakeholders.

The analysis would determine the relevance of SIF in improving

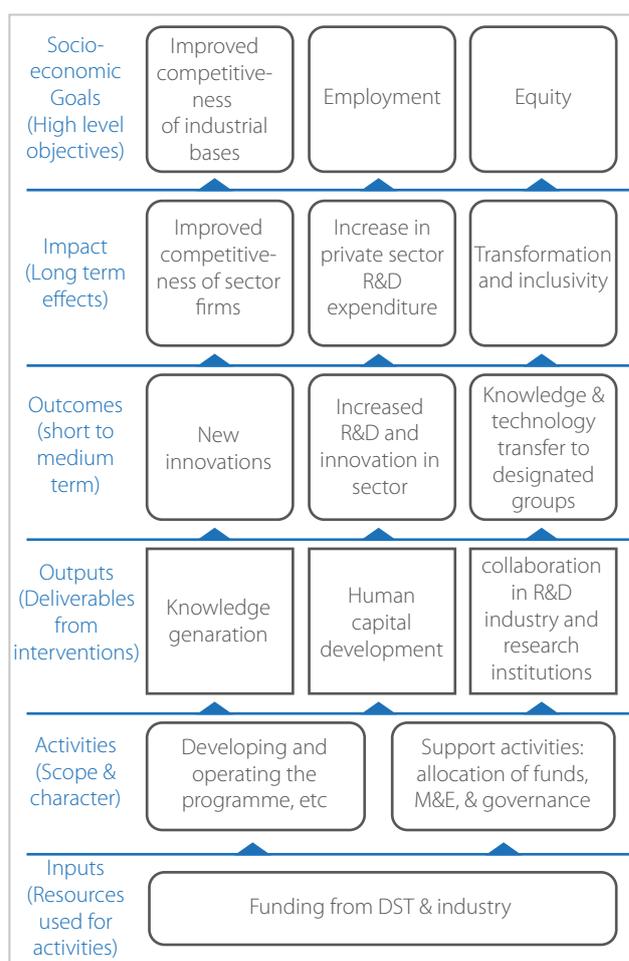
South Africa's global competitiveness. South Africa's ranking had declined from 47 in 2016 to 67 in 2018. Initial findings were that SIF had not contributed to improved competitiveness as informed by the first quarter reports, but there were signs of growing competitiveness. It was noted that results could not be seen immediately for projects funded for three years (slides 9 and 10).

Further analysis addressed SIF's contribution to the declining business enterprise expenditure on research and development (BERD) as a proportion of gross domestic expenditure on research and development (GERD). It was established that business should invest more in R&D (slides 11 and 12).

SIF's contribution to BERD raised significant issues. Co-funding remains low and on average industry pays three times what the government pays. This is variable from year to year and industries such as sugar investment more.

The presentation analysed key issues of SIF design. There is no written logic model although indicators and components were used to build the model. Comments to improve the logic model were welcomed. Below is a diagram of the SIF logic model drawn from slide 13.

- ▶ Asterisks need to be replaced with 'and' in the below diagram, except R&D

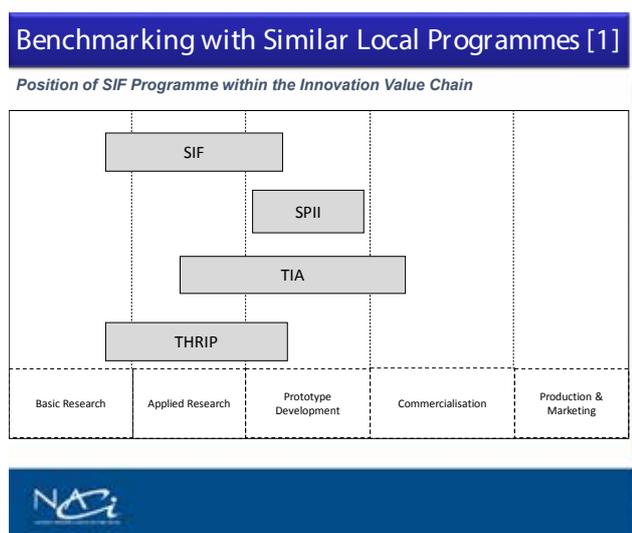


Dr Letaba addressed the alignment of SIF performance metrics with its objectives (slide 14) and explained how participating industries were selected and the eight key selection criteria (slides 15 and 16). Supported industries ranked according to technology intensiveness were then shared (slide 17) and the mapping of SIF-funded sectors according to Pavitt's Taxonomy (slide 18).

The presentation then analysed key SIF implementation issues (slides 19 to 25). Dr Letaba provided an analysis of SIF programmes as a triple helix model, revealing the evolution from statist to laissez faire model likely to evolve into a balanced model. Cross-cutting sector challenges and industry needs were identified. The nature of innovation for SIF-supported projects was discussed and reference made to basic research, frugal innovation, disruptive innovation, radical innovation and incremental innovation as percentages. Principal researchers are still predominantly white males but there are signs of transformation. Opportunities for new participants were outlined and proposals made for conflict-of-interest management.

Slides 26 and 27 presented evidence of SIF impact and knowledge transfer of SIF-funded researchers was analysed with indicators of sector competitiveness. No reporting on improvements was in place.

Benchmarking with similar local programmes (slides 28 to 31) was discussed and reference made to SIF positioning in the innovation value chain. In essence the aim is to conduct applied research in response to industry needs. Differences between SIF and the Support Programme for Industrial Innovation (SPII), the Technology Innovation Agency (TIA) and the Technology and Human Resources for Industry Programme (THRIP) were outlined, as were similarities between SIF and TIA and THRIP. This was important when looking at the position of SIF in the innovation value chain (slide 28) as seen below.



Benchmarking with international programmes was addressed in slides 31 to 35 and focused on improved competitiveness in selected international programmes. Criteria for funding and governance structures in these programmes were defined, as were further criteria for inclusion.

The following points were made:

- ▶ SIF is still new and is an example of policy experimentation and flexible implementation, although standardisation would be required as it expands.
- ▶ Programme performance indicators need to be reconsidered carefully (for example short- versus long-term targets and coverage of all objectives).
- ▶ The need to focus on partnerships with other local programmes to achieve the desired impact.
- ▶ The benefits of drawing on experience from similar international programmes (taking into context local conditions).

## 2.1 Questions and comments

The facilitator summed up as follows:

- ▶ Participation remains dominated by white males but transformation is taking place.
- ▶ There is limited participation by previously disadvantaged institutions such as the University of Fort Hare. SIF may still favour existing networks and a specific cluster of universities may continue to have a strong presence.
- ▶ There appears to be no broader participation and Brazil ring-fenced a portion of its programme funding for development, specifically for excluded actors.
- ▶ There is limited participation of science councils and more involvement would be expected from science councils such as the Council for Scientific and Industrial Research. Only Mintek and the Agricultural Research Council are currently involved.
- ▶ The Organisation for Economic Cooperation and Development classification system for technology intensiveness may be useful. If the government aims to increase R&D expenditure, it needs to attract these sectors.
- ▶ The triple helix was a by-product of the study and is a powerful approach to improving innovation as it brings in social partners.
- ▶ SIF and THRIP occupy a very similar position in the innovation value chain and have complementary activities.

## Key issues raised

### Resource allocation

The current R10 million available to each sector is inadequate and not conducive to global competitiveness. The directives and conditions informing resource allocation must be clarified. Additional funding is needed to move these processes to the next level such as patents. The amount of funding is crucial given what DST wants to achieve.

Responses: There is no real explanation for the amount of funding, which is important. R&D investments are also low but it is a matter of working with what is available. The three-year funding cycle is problematic for some sectors and is too short, while for information and communications technology, it is significant.

## Evaluation

It is too soon to evaluate SIF but there is early evidence of impact. If an evaluation is premature perhaps the review is too. In addition, those funded by SIF also received funding from elsewhere, making attribution more complex.

Responses: It is possible to present on the strengths of what has been achieved so far. There is substantial qualitative data on the impact of the programme and it is confirmed that National Treasury will provide support for a further three years.

## Industry collaboration

Industries that collaborate are well organised. SIF does not create inventions for innovation but rather initiates collaboration with various sectors.

## Funding allocations and duplication

Ninety percent of the organisations funded by SIF have been funded by THRIP - funding is substantial. When SIF was formed there was no unique offering, so different outcomes cannot be expected. Associations were developed by university researchers, not companies. Companies also donate funds to associations. SIF needs clarity on what it is supporting and whether current beneficiaries are still relevant.

Responses: There is duplication between SIF and THRIP and this may be a strength. Universities are drivers of innovation and technology and industry is the beneficiary. Universities build human capacity for the industry. Industry needs to take more responsibility for the technology transfer it considers most useful. Human capacity is likely to remain a challenge but the underfunding of technology needs to be scrutinised.

## Positioning in the innovation value chain (slide 28)

SIF's positioning in the innovation value chain was discussed extensively. Linkages should be drawn and issues of duplication or complementarity should be better understood. SIF needs to clarify where it is positioned.

The innovation value chain as presented does not address commercialisation, production and marketing, and this is an important omission. Industry would not take up this role and innovations would effectively remain dormant. TIA is more focused on these aspects and also indicates what industry funding resources are in place. The maize industry association spends 6% of its budget on research, transformation and marketing, which is low. For competitiveness, at least 1.5% of industry turnover should be allocated.

SIF needs to understand that innovators and inventors do not want to start businesses and there are no structures in place to take innovations forward. The Industrial Development Corporation (IDC) focuses on business start-ups and, thus, is not addressing the needs of innovators.

If technology and innovations are not taken forward, competitiveness would suffer. SIF should support industries lacking knowledge transfer capabilities.

Responses: SIF's positioning in the value chain is important and the comments and responses assist in thinking about the issue more broadly. The entire value chain needs to be understood to ensure that industry implements innovation and technology for competitiveness. The pathway must be clear and the value chain complete, or SIF will fail in making South Africa more competitive. Only when the entire value chain is understood will it be possible to advise policymakers on enhancing competitiveness.

Academics and researchers are not focused on the business side of their innovations, which suggests a role for technology transfer offices. An academic innovator may not be an entrepreneur. This introduces the need for a small business enterprise value chain that includes a different set of actors. Different value chains must intersect and talk to each other, even though challenges arise when some voices are more dominant than others.

## Transformation

Transformation would not be achieved if it is not stated upfront. The programme remains linked to those who are research intensive. It is a systemic problem from the university side.

## Selection of sectors

An attempt is being made to increase business expenditure on R&D, but the focus is on only one sector. This must be addressed as some crucial sectors have been left out while others, such as citrus, have multiple sources of funding. The three-year cycle is too short for most sectors to achieve adoption and impact. Five to 10 years is a more realistic timeframe. The funding process is unclear and it needed to be determined if funding results from lobbying or takes place through a competitive process.

Responses: A well-advertised open call for funding across various media was placed and funding was disbursed according to proposals. Science councils were not specifically excluded but did not respond to the call. The selection criteria allowed for those willing to be assisted and a study was conducted to determine the needs of the sector. DST intervened in less-organised sectors. If problematic sectors with potential are identified, they should be supported and developed further.

SIF should consider sectors that are not organised but are important, such as vegetables and flowers. These industries should be competitive but there is no R&D.

Essentially the process was demand-led and business-led and industry set the agenda. When challenges emerged, support was offered.

### Openness and transparency

The call was widely published nationally on various platforms. The evaluation of proposals took place across the government and included TIA and National Treasury.

### Technology intensiveness

TIA funds in high-technology areas such as pharmaceuticals, whereas SIF focuses on low technology. This was not intended and is not desirable. Clusters function better than SIF as more stakeholders and partners are involved. It is important to study the focuses of SIF, TIA and THRIP as the objective is to develop products or outputs. Whether SIF is responding to the desire of academics for funding to support industries was questioned. SIF should address problems faced by certain industries. The right questions must be asked. If SIF was established to improve global competitiveness, perhaps the wrong questions are being asked. If the wheat industry has a low yield, the question should be related to this.

### Industry spend

Pharmaceutical industry spend on R&D is high and the citrus industry spends too little, which is true across the agricultural sector. Spending in the different sectors must be understood for assistance to be valuable.

### Industry examples

The citrus industry experiences significant postharvest losses and this requires research input. TIA funding to the beef industry led to a three-year socio-economic impact study on breeding programmes. This should be emulated after baselines are understood. Accessing government funding encouraged beef industry participants to work together and identify problems facing the sector. Budget priorities should be clarified. There is a need for improved data to follow the value chain for greater impact. National Treasury must be convinced about returns that are possible.

### Less-successful projects

The boat industry may have needed more incubation to succeed. Perhaps industry and innovation need to be overlaid.

### Commitments expressed

Dr Letaba agreed to reflect on issues raised and refine the framework. The view that SIF does not have a value proposition resonated and this will be addressed. This review was the outcome of looking at the programme as it stands, was drafted subsequent to the establishment of SIF and did not form part of

the founding documentation. It was derived from documentation but is not a summary of documents. It was acknowledged that measuring the programme would rely on how the programme was implemented.

## 3. PANEL DISCUSSION: STRENGTHENING OF SECTORAL INNOVATION SYSTEM SUPPORT MECHANISMS

Facilitated by Dr Mlungisi Cele

Dr Mzi Madikizela, University of Pretoria

Performance indicators were incorporated into the programme at an early stage. Not all issues were addressed in the available time but the evaluation allows for this and for refinement. A programme strength is its bottom-up approach. The government does not decide what must be done but gives opportunities to industries. The business plan is similar to those of international programmes and asks specific questions about industries.

Sweden was cited to indicate how much industries should contribute. There, 75% is allocated to newer industries in the first round and this is gradually reduced. Quarterly reports to track progress are required - an example of a good practice. SIF should produce annual reports to assist evaluation. Information gaps were discovered and different ways of reporting. Some indicators were not clear and feedback was helpful.

Whether the programme will improve competitiveness is an important question, but it should not be seen in isolation as other programmes are making contributions and forming a policy mix. The World Economic Forum publishes an annual competitiveness ranking that shows many factors that contribute to competitiveness. South Africa is highly ranked in innovation but not for health and primary education, which undermines its competitiveness ranking.

Generally, innovation policies have not had the impact desired so it is important to learn and adjust.

Mr Sunita Kalan, Department of Science and Technology

The experimental nature of this programme is important. In the past, the private sector was not approached so this is not an area of DST expertise. Some headway has been made, trust has been built in the three-year programme and funding is secured.

Funding is not sufficient, but the concept will proceed. SIF was the product of a ministerial review that determined that DST needs to work with civil society and the private sector.

Private sector investment must be relevant to the economy of South Africa and to business. SIF's position in the value chain may reinforce a silo mentality, thus a more inclusive and consultative approach is needed.

Lessons have been learnt about the need for direct transformation and directives such as research team composition have been included in the selection criteria.

## Ms Vanessa Davidson, South African Boat Builders Export Council/Boating South Africa

Ms Davidson provided information on the boatbuilding industry, which has been involved in significant Catamaran production since 2004, being commercialised from the '80s and early-'90s.

This industry demands knowledge-driven innovation and a different lens is needed to understand this. The industry wants to progress, but academics and the government have different understandings of innovation. Tensions were apparent from the outset as DST wanted benefits to extend to the whole sector. Different players in the value chain have different needs. The industry is highly individualised and has numerous niche products.

It is not clear where the industry fits in with the different types of innovation. The focus should be not only on products but on how companies structure themselves. The boat-builders association is a small operation and operationally challenging. In addition, sector R&D takes place internationally and there is reliance on imports. These factors all point to the complexity of the boatbuilding value chain.

## Prof Mark Laing, University of KwaZulu-Natal

SIF is missing less-organised sectors such as vegetable and flower growers. For them to become organised requires a top-down intervention.

The value chain should be reviewed as well as downstream processes. Academics tend to focus on peer review journal articles and it is unclear who will take up and further this work.

Return on investment should form part of proposals so that the economics of industries are understood. It is very difficult to measure impact and possibly specialist evaluators should be co-opted. National Treasury could be persuaded to support this.

Most funding is drawn from industry. THRIP functioned well in the past but not in the present. SIF has been a lifeline given the dearth of funding in the sector and is contributing to the next generation of experts.

Some in the sector do not embrace changes to practices and processes, thus conflicts of interest arise.

## Mr Phindile Shabangu, Savant Incubators

Mr Shabangu confirmed that defining industries is problematic. Industries have evolved - many are cross-cutting, but industry associations are exclusive. It is possible to be excluded if the focus is on innovation, to the detriment of transformation.

Low funding is not necessarily the central problem. It would be more important to improve the value proposition and leverage what is available now.

Inadequate delineation of systemic issues has also had an impact and this should be addressed.

It is important to include participants for funding from outside the usual structures.

### 3.1 Questions and comments

**Comment 1:** the Paper Manufacturers Association of South Africa (PAMSA) believes the SIF funding timeframe is too short. Papermakers compete among themselves. Intellectual property is problematic. Further funding is raised and a university is selected to conduct research. Associations are not profit-making and are managed through co-option. There is a significant focus on support for postgraduates to PhD level, which cannot be completed in three years. The projects are not industry problems as public funds cannot be used. The projects are innovative, some near completion and some can be patented. PAMSA has innovative ideas and processes and aims to build knowledge for the industry.

**Response:** It is not clear whether researchers are entitled to permanent applied research funding. The attitudes of academics need to be challenged.

**Comment 2:** THRIP determined whether companies required government funding to make a difference. Where funding was not necessary it was allocated elsewhere.

**Response:** THRIP was functional but the system now appears fragmented. SIF is not new and its objectives are similar to THRIP's. The government should provide seed funding and companies become more self-sufficient later.

**Comment 3:** The initial target was the government and industry but this shifted. An industry-government approach moving towards the triple helix may not be appropriate. The government's mandate is to promote innovation and not respond just to industry requirements.

**Response:** The triple helix was drawn from the ministerial review. SIF has evolved towards the balanced approach. It is more about innovation than knowledge.

**Comment 4:** SIF's relocation was debated, including the need to work more widely with other departments.

**Response:** When SIF started, TIA was not ready to take it on. Ultimately SIF may be located within TIA. It was always clear that it would not be positioned at DST permanently. Work is being done with the Department of Forestry and Fisheries but it is a minimal partnership at this stage. Line departments were intended to ultimately take ownership. In the National System of Innovation (NSI), DST's roles are strategy, policy and regulation, while the National Research Foundation and TIA are agencies. Programmes should be correctly positioned. The evaluation should inform whether the instrument is properly placed and fit for purpose. The target is sectors, not individual players. Understanding the NSI will ensure that functions are placed correctly.

**Comment 5:** A strategy is needed to respond to the failure of the boatbuilding industry.

**Response:** Boatbuilding is driven by demand, but opportunities exist in shared equipment and infrastructure.

**Comment 6:** It may be beneficial to focus less on return on investment and develop a new approach to evaluation with emphasis on a healthy ecosystem. This would be more nuanced and address the entire system.

**Comment 7:** SIF may have overlapping functionalities but there are positives. The outcomes have been useful and improvement is probable. SIF should consider a partnership-building approach and look at co-development.

## 4 CONCLUSION

Dr Cele thanked all participants for their valuable inputs and committed to taking the process forward.

The meeting ended at 13:15.





