

ANNUAL PERFORMANCE PLAN 2021-2022

AGRICULTURAL RESEARCH COUNCIL



ARC • LNR

Excellence in Research and Development



AGRICULTURAL RESEARCH COUNCIL

ANNUAL PERFORMANCE PLAN

FOR

2021/22

ACCOUNTING AUTHORITY STATEMENT

The ARC Council is pleased to present the Agricultural Research Council (ARC) Annual Performance Plan (APP) for the 2021/22 financial year, which was developed in-line with the ARC Strategic Plan 2020-2025.

The APP 2021/22 has been developed after the assessment of the ARC performance in the previous term, looking at both successes, failures, challenges, and on the basis of previous lessons learnt.

The Strategic Plan (2020 - 2025) outlines the ARC mandate, strategic focus, priorities, impact and outcomes, as approved by the Council (the ARC Accounting Authority) and this APP serves as an implementation mechanism through outcome-aligned outputs, indicators, annual and quarterly targets for 2021/22.

In pursuit of the National Development Plan 2030¹ vision to “*create 1 million jobs in the agricultural sector; and to ensure that one million hectares are used to produce crops including fruit and livestock, and to provide superior breeding animals to targeted smallholder and subsistence farmers*”, the Agricultural Research Council has outlined its contribution to strengthen the agriculture sector, and contribute to unlocking of its potential to grow the economy, create jobs, ensure food security, and contribute to reduced inequality and poverty.

The ARC's Strategic Plan outlines the organisation's contribution to the following 2019 - 2024 Medium Term Strategic Framework (MTSF) priorities²:

- 1) Priority 1: A capable, ethical and developmental state;
- 2) Priority 2: Economic transformation and job creation;
- 3) Priority 3: Education, Skills and Health;
- 4) Priority 5: Spatial integration, human settlement and local government; and indirectly to, and
- 5) Priority 7: A Better Africa and the World.

In order to deliver on the priorities of the current government, and informed by instructing legislation and policies, the primary mandate of the ARC is to conduct and drive research and development, technology development and dissemination of information in order to:

- 1) Promote agriculture and industry;
- 2) Contribute to better quality of life;
- 3) Facilitate and ensure natural resource conservation, and
- 4) Alleviate poverty.

Informed by this primary mandate, the ARC has revisited and reconceptualised its strategic position and framework in the Strategic Plan, to ensure it is well-articulated and fit for purpose to guide the organisation over the period to 2025.

¹ Available: <https://www.gov.za/issues/national-development-plan-2030>

² Available: <https://www.dpme.gov.za/keyfocusareas/outcomesSite/Pages/mtsf2021.aspx>

In fulfilling its primary mandate, for the period to 2020-2025, the ARC will focus on achieving the following strategic medium-term results through its research and development focus:

- 1) Ensuring the ongoing genetic improvement of crops and livestock;
- 2) Developing and rolling out solutions, processes and technologies to enhance the agriculture value chain;
- 3) Promoting ecosystem sustainability, and the anticipation and mitigation of agricultural risks;
- 4) Supporting inclusive market-orientated development for smallholder farmers, agri-businesses and enterprises in the agriculture value chain;
- 5) Supporting the ongoing transformation of the agriculture sector;
- 6) Consolidate its position as the National agriculture research and development leader and continue to enhance its role in the global agriculture research and development space; while
- 7) Ensuring a sustainable research organisation, displaying sound governance, operational excellence, and high-performance.

Towards achieving these outcomes, the Council will ensure that the ARC puts in place annual performance plans, which will be supported by an aligned annual operational plan informing the performance contracts of management and staff.

As the Council assumed duty on the 01 July 2020, the following key issues, both from a governance as well an implementation perspective, have received attention, and will continue to receive attention during the implementation of this APP 2021-2022:

1. The Council Charter, to ensure efficiency and effectiveness of Council and its Committees' oversight role in execution of its mandate to align with the changing legislation, policies and directives of the Shareholder;
2. The COVID-19 pandemic and its negative impact on the financial viability and sustainability of the ARC, and especially on external income and the implementation of the APP 2020/21;
3. The development of a shareholder's compact to manage relationships with the Minister and the Department of Agriculture, Land Reform and Rural Development;
4. The balance between the required skills and scientific capacity and outputs for the ARC to produce excellence and affordability;
5. The Audit outcomes for the 2019/20 financial year and the required improvements that must be made, and
6. A key focus on the construction of the FMD facility, and
7. The Turn-around Strategy, review and accelerate the implementation of the turn-around plan to ensure long-term financial sustainability of the ARC.

A critical input from the Minister for Agriculture, Land Reform and Rural Development further enhanced the governance oversight required by Council as well as the preparation of this APP, to reposition the ARC to enhance its financial position (self-sustaining) and to ensure value addition to the agricultural sector. The Turn-Around strategy designed by the previous Council will serve as the basis to interrogate the requirements of the ARC and its mandate but also to explore opportunities for income generation whether through innovation, technology development, Intellectual Property protection, partnership arrangements with other research organisations and universities. The sustainability of the ARC is critical to support the agricultural sector and the economy.

In closing, the Council affirms its commitment to providing strategic oversight that will ensure the re-alignment of the ARC into a well-resourced entity that is optimally positioned, for delivering on its mandate. The Council also realises that the above can only be achieved through 100% dedication by the entire ARC team and will endeavour to create a conducive environment that will enable management and staff to execute their task efficiently and effectively.

The Council acknowledges the continuous support of the Portfolio Committee and the Minister of Agriculture, Land Reform and Rural Development (DALRRD) in spurring the entity towards realising its mandate.

While an immense amount of work lies ahead of us in the next four years, we believe that the Strategic Plan 2020 - 2025 reflects the right ideas, plans and resource considerations to ensure achievement of the ambitious plan, commencing with the work reflected in this 2021/22 APP.

The Council fully endorses the Annual Performance Plan for 2021/22.

I thank you.



Ms. Joyene Isaacs

Chairperson of Council

AGRICULTURAL RESEARCH COUNCIL

CHIEF EXECUTIVE OFFICER AND PRESIDENT STATEMENT

On behalf of the ARC Management Team, we hereby present the Annual Performance Plan for the Agricultural Research Council (ARC) for the financial year 01 April 2021 until 31 March 2022. This Annual Performance Plan (APP) is presented in terms of the Agricultural Research Act, 1990 (Act no. 86 of 1990, as amended by Act 27 of 2001³), and the Public Finance Management Act, 1999 (Act no. 1 of 1999, as amended by Act 29 of 1999⁴).

Continuous improvement is an essential element for effective and efficient use of resources towards enabling the ARC to fulfil its mandate. Management and Council embarked upon an iterative and reiterative consultative process that included review of progress against a wide variety of performance metrics in the previous term (2014 – 2019) and during financial year 2020/21. Outcomes of such analysis served as a basis towards lessons learnt and opportunities for improvements in the development and implementation of the 2021-2022 Annual Performance Plan.

Briefly, South Africa must ensure improved agricultural productivity and reduction of post-harvest losses to maintain national and household food security, sustainable growth of the sector and job creation. To achieve this, South Africa must embrace new global trends for agricultural intensification, including on natural resource use efficiency (water, land, flora and fauna), and energy. As a national Science Council, the ARC is most suited through its research and development and technology transfer mandate to provide the requisite solutions for sustainable agriculture that contributes towards enabling the country to meet its food demand/s.

Research and innovation are critical elements for enabling agricultural productivity, biosecurity, sustainable and competitive enterprises in the sector. As a key provider of scientific solutions and technologies for the management of pests and diseases as well as the mitigation/adaptation to climate change, a non-functional ARC would present significant threat to food and nutrition security, agriculture and economic growth, peace and development. It is therefore essential to ensure a financially resourced and sustainable ARC that is able to fulfil its mandate.

In order to ensure a sustainable ARC that is able to fulfil its mandate the organisation has developed a “Financial Sustainability and Turnaround Plan” to be implemented throughout the Medium Term Expenditure Framework (MTEF) period. The plan aims for a financially sustainable business model that:

- a) Explores efficiencies and effectiveness of generating revenue from existing clients and new sources, inclusive of the business of the future;
- b) Effective and optimal use of financial and other resources through various means, inclusive of cost saving, efficiencies, competitive pricing of services, amalgamation and other mechanisms;
- c) Review of the ARC's organizational structure (e.g. optimal ratio of cost of employees to baseline operational parliamentary grant, reduction in the use of the parliamentary grant for the Professional Development Program (PDP) etc.);
- d) Non-personnel organisational reconfiguration, inclusive of amalgamation of ARC facilities, commercialization of farming operations among others; and,
- e) Resource mobilization through increased partnerships and other stakeholder relationships.

The outbreak and transmission of the SARS-CoV-2, the virus that causes the COVID-19 disease has presented unprecedented challenges for humanity, businesses and the economy at large. Various reports by Statistics SA suggest that the South African economy suffered a significant GDP contraction with associated losses in growth and jobs. Although agriculture was designated an essential service

³ Available: <https://www.arc.agric.za/Documents/Agricultural%20Research%20Act%20%2086%20of%201990.pdf>

⁴ Available: <http://www.treasury.gov.za/legislation/PFMA/act.pdf>

during the various movement restrictions (COVID-19 lockdowns), the transmission and spread of the virus negatively reduced interaction/s among various stakeholders in sector. Further, regulatory restrictions on alcohol sales reduced the production and processing of grapes for wine and barley for beer.

During the same period, the ARC experienced significant reduction in diagnostic and analytical laboratory services, mainly due to movement restrictions, particularly among farmers and associated service providers. To date, the consequences have been significant reductions in research services, diagnostic and analytical services offered by the ARC; which in turn, resulted in lower external revenue generated. Accordingly, the ARC has considered the continued likely impact (risks) associated with COVID-19 on forward looking business prospects in the MTEF for the period FY 2021 – 2023 in the following manner:

- Future business operations and revenue generation;
- Impacts on cost drivers of the ARC;
- Impact of the reduction of employee related costs (linked to co-morbidities and unavailability of employees during critical times for the sector); and,
- Impact of non – payment from private customers.

The ARC had undertaken a 360-Degree Leadership Assessment and a Culture Survey during the 2020/21 financial year. The outcomes resulting from the assessment and survey contributed in the development of a Change Management Strategy, for which implementations plans would be developed and progress thereof tracked during the period of this Annual Performance Plan.

In response, this APP 2021-2022 seeks to bring to reality objectives set in the Strategic Plan for 2020-2025 towards achievement of the ARC vision for *“excellence in research and innovation for sustainable agricultural systems and economic development”*.

In achieving its vision, the ARC will actively pursue its mission to *“conduct research, develop partnerships and human capital, to foster innovation for a sustainable agriculture sector”*. This is done to:

- 1) Promote sustainability and equitable economic participation in the agricultural sector;
- 2) Promote agriculture development and growth in related industries;
- 3) Facilitate sector skills development and knowledge management;
- 4) Facilitate and ensure natural resource conservation;
- 5) Promote national food and nutrition security, and
- 6) Contribute to improved health and better quality of life.

Informed by its mission, and aligned to the MTSF priorities⁵ and outcomes, the Agricultural Research Council has defined its outcomes for the period to 2025, which direct its strategic focus and inform the Outputs of this Annual Performance Plan, towards:


- 1) Researching, developing and disseminating solutions, processes and technologies to increase agricultural production and productivity;

⁵ Available: <https://www.dpme.gov.za/keyfocusareas/outcomesSite/Pages/mtsf2021.aspx>

- 2) Researching, developing and disseminating solutions, processes and technologies to promote sustainable ecosystems and natural resources;
- 3) Researching, developing and disseminating solutions, processes and technologies to improve the nutritional value, quality and safety of agricultural products;
- 4) Researching, developing and disseminating solutions, processes and technologies to enhance the resilience of agriculture;
- 5) Growing a skilled and capable agriculture sector through innovation, knowledge and technologies;
- 6) Securing partnerships and strategic alliances, and partnering with relevant stakeholders to support the realisation of the ARC's mandate, and
- 7) Implementing an enhanced operating model that is future focused and supports a sustainable, agile and performance orientated organisation.

The plan is ambitious, but with the continuous support of the Minister and the Council in leading the organisation, it is achievable. Your commitment to strong oversight and governance is acknowledged and appreciated. I also thank the staff of the Agricultural Research Council for their hard work and outstanding commitment.

In closing, I affirm my commitment to lead the Agricultural Research Council to the best of my ability, as it strives to deliver on the priorities, outcomes and outputs reflected in this Plan.



Dr. Shadrack Moephuli






Chief Executive Officer and President

AGRICULTURAL RESEARCH COUNCIL

OFFICIAL SIGN-OFF

It is hereby certified that this 2021/22 Annual Performance Plan:

- 1) Was developed by the executive and senior management team of the Agricultural Research Council, under the guidance of the Council;
- 2) Takes into account all the relevant policies, legislation and other mandates for which the Agricultural Research Council is responsible;
- 3) Accurately reflects the outputs and targets which the Agricultural Research Council will endeavour to achieve over the 2021/22 financial year.

| | | | | |
|---|---|---|--|---|
|  |  |  |  |  |
| Dr. N. Motete | Dr. A. Magadlela | Dr. T. Mkhabela | Dr. H. Vergotine | Dr. T. Sethibe |
| EXECUTIVE: CROP SCIENCES | EXECUTIVE: ANIMAL SCIENCES | EXECUTIVE: IMPACT & PARTNERSHIPS | EXECUTIVE: HR & LEGAL SERVICES (Acting) | EXECUTIVE: INFORMATION SYSTEMS |

| | |
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|  | <u>26 February 2021</u> |
| Dr. Hilton Vergotine | Date |
| GENERAL MANAGER: RISK AND PLANNING | |

| | |
|---|-------------------------|
|  | <u>26 February 2021</u> |
| Ms. Maureen Manyama | Date |
| CHIEF FINANCIAL OFFICER | |

| | |
|---|-------------------------|
|  | <u>26 February 2021</u> |
| Dr. Shadrack Moephuli | Date |
| CHIEF EXECUTIVE OFFICER AND PRESIDENT | |

APPROVED BY:

| | |
|---|-------------------------|
|  | <u>26 February 2021</u> |
| Ms. Joyene Isaacs | Date |
| ACCOUNTING AUTHORITY | |
| CHAIRPERSON OF COUNCIL | |

ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|--|
| 4IR | 4th Industrial Revolution |
| AAMP | Agriculture and Agro-processing Masterplan |
| AfCFTA | African Continental Free Trade Agreement |
| AGSA | Auditor-General of South Africa |
| AHS | African Horse Sickness |
| AP | Animal Production |
| APP | Annual Performance Plan |
| ARC | Agricultural Research Council |
| AU | African Union |
| AX | Microsoft Dynamics AX |
| B-BBEE | Broad-Based Black Economic Empowerment |
| BFAP | Bureau for Food and Agricultural Policy |
| BRICS | Brazil, Russia, India, China and South Africa |
| BT | Bluetongue |
| BVI | Botswana Vaccine Institute |
| CA | Conservation Agriculture |
| CEC | Crop Estimates Committee |
| CEO | Chief Executive Officer |
| CETC | Community Education Training Centre |
| CottonSA | Cotton South Africa |
| COVID-19 | Coronavirus |
| CRM | Customer Relationship Management |
| CSA | Climate Smart Agriculture |
| CSIR | Council for Scientific and Industrial Research |
| DALRRD | Department of Agriculture, Land Reform and Rural Development |
| DEFF | Department of Environment, Forestry and Fisheries |
| DHET | Department of Higher Education and Training |
| DMRE | Department of Mineral, Resources and Energy |
| DOH | Department of Health |
| DPME | Department of Planning, Monitoring and Evaluation |
| DR | Disaster Recovery |
| DSI | Department of Science and Innovation |

| | |
|-----------------|--|
| DTIC | Department of Trade, Industry and Competition |
| DWS | Department of Water and Sanitation |
| ECDC | Eastern Cape Development Corporation |
| EIA | Environmental Impact Assessment |
| EMC | Executive Management Committee |
| EMDEs | Emerging Markets and Developing Economies |
| ERP | Enterprise Resource Planning |
| ESD | Enterprise Supplier Development |
| EU | European Union |
| FAO | Food and Agriculture Organisation |
| FDI | Foreign Direct Investment |
| FMD | Food and Mouth Disease |
| FSR | Farming System Research |
| GAP | Good Agricultural Practices |
| GC | Grain Crops |
| GDP | Gross Domestic Product |
| GE | Group Executive |
| GERD | Gross Domestic Expenditure on Research and Development |
| GG | Global Grade |
| GHG | Greenhouse Gas |
| GMP | Good Manufacturing Practice |
| GPS | Global Position System |
| GRAP | Generally Recognised Accounting Practice |
| HEI | Higher Education Institution |
| HP | Hewlett-Packard |
| HR | Human Resources |
| ICT | Information and Communication Technology |
| IDC | Industrial Development Cooperation |
| IGR | Intergovernmental Relations |
| IMF | International Monetary Fund |
| INF-NVB | Deciduous Fruit, Vines and Wine |
| INTERGIS | Integrated Registration and Genetic Information System |
| IP | Intellectual Property |
| IPAP | Industrial Policy Action Plan |

| | |
|----------------|--|
| IPCC | Intergovernmental Panel on Climate Change |
| IPR | Intellectual Property Rights |
| IWYP | International Wheat Yield Partnership |
| KPI | Key Performance Indicator |
| KyD | Kaonafatso ya Dikgomo |
| LIFO | Last In First Out |
| LIMS | Laboratory Information Management System |
| M&E | Monitoring and Evaluation |
| MFU | Multi-Functional Units |
| MINMEC | Ministers and Members of Executive Council |
| MoA | Memorandum of Agreement |
| MoU | Memorandum of Understanding |
| MSC | Master of Science |
| MT | Maize Trust |
| MTBPS | Medium-Term Budget Policy Statement |
| MTSF | Medium-Term Strategic Framework |
| MV | Military Veteran |
| NAMPO | South African Agricultural Trade Show |
| NARIS | National Animal Recording and Improvement Scheme |
| NDP | National Development Plan |
| NERPO | National Emergent Red Meat Producers Organisation |
| NGP | New Growth Path |
| NIPMO | National Intellectual Property Management Office |
| NRE | Natural Resources and Engineering (Soil, Climate and Water & Agricultural Engineering) |
| NRF | National Research Foundation |
| OECD | Organisation for Economic Co-operation and Development |
| OHSA | Occupational Health and Safety Act |
| OPOT | Oil and Protein Seed Development Trust |
| OTT | Office of Technology Transfer |
| OVR | Onderstepoort Veterinary Research |
| PDA'S | Provincial Department (s) of Agriculture |
| PDP | Professional Development Programme |
| PFMA | Public Finance Management Act |

| | |
|----------------|--|
| PG | Parliamentary Grant |
| PhD | Doctor of Philosophy |
| POPI | Protection of Personal Information |
| PHP | Plant Health and Protection |
| PPP | Public Private Partnerships |
| PRF | Poliomyelitis Research Foundation |
| PSA | Public Service Association |
| PSET | Post-School Education and Training |
| PwD(s) | People with Disability/ies |
| R&D | Research and Development |
| ROI | Return on Investment |
| RPO | Red Meat Producers Organisation |
| RQO | Resource Quality Objectives |
| SAAGA | South African Avocado Growers Association |
| SADC | South African Development Community |
| SAGAP | South African Good Agricultural Practices |
| SAHPRA | South African Health Products Regulatory Authority |
| SAMAC | South African Macadamia Association |
| SANReN | South African National Research Network |
| SANSOR | South African National Seed Organisation |
| SAPPA | South African Pecan Nut Producers Association |
| SAPS | South African Police Service |
| SCM | Supply Chain Management |
| SDG | Sustainable Development Goal |
| SET | Sector Education Training |
| SG | Small Grains |
| SHF | Small-Holder Farmer |
| SLA | Service Level Agreement |
| SM | Senior Manager |
| SMART | Specific, Measurable, Achievable, Realistic and Time-bound |
| SMME | Small, Medium and Micro Enterprise |
| SOC | State-Owned Company |
| SOE | State Owned Entity |
| SONA | State of the Nation Address |

| | |
|-----------------|---|
| SQL | Structured Query Language |
| SWOT | Strengths, Weaknesses, Opportunities, Threats |
| TSC | Tropical and Subtropical Crops |
| TVET | Technical and Vocational Education and Training |
| UK | United Kingdom |
| UN | United Nations |
| USA | United States of America |
| VAT | Value Added Tax |
| VC | Value Chain |
| VIMP | Vegetables, Industrial and Medicinal Plants (Vegetable and Ornamental Plant Institute and Industrial Crops) |
| VOCs | Variants of Concern |
| WCT | Winter Cereal Trust |
| WINETECH | Wine, Industry, Network for Expertise and Technology |

TABLE OF CONTENT

| | |
|--|-----------|
| ACCOUNTING AUTHORITY STATEMENT..... | 2 |
| CHIEF EXECUTIVE OFFICER AND PRESIDENT STATEMENT | 5 |
| OFFICIAL SIGN-OFF | 8 |
| ABBREVIATIONS AND ACRONYMS | 9 |
| PART A: OUR MANDATE..... | 17 |
| 1. <i>UPDATES TO RELEVANT LEGISLATIVE AND POLICY MANDATES.....</i> | <i>20</i> |
| 1.1. Updated Legislative Mandates | 20 |
| 1.2. Updated Policy Mandates..... | 20 |
| 2. <i>UPDATES TO INSTITUTIONAL POLICIES AND STRATEGIES</i> | <i>20</i> |
| 3. <i>UPDATES TO RELEVANT COURT RULINGS.....</i> | <i>21</i> |
| PART B: OUR STRATEGIC FOCUS | 22 |
| 4. <i>UPDATED SITUATIONAL ANALYSIS</i> | <i>22</i> |
| 4.1. External Environment Analysis | 22 |
| <i>Global Economic Outlook</i> | <i>22</i> |
| <i>Emerging Macro Economic Factors And Trends.....</i> | <i>22</i> |
| <i>South African Economic Outlook And Emerging Trends</i> | <i>24</i> |
| <i>Global Outlook For Agriculture</i> | <i>27</i> |
| <i>South African Agricultural Outlook.....</i> | <i>30</i> |
| <i>Current And Future Climate Conditions With Implications On Agricultural Production ..</i> | <i>31</i> |
| <i>Implications Of COVID-19 Outbreak</i> | <i>34</i> |
| 4.2. Internal Environment Analysis | 35 |
| <i>Analysis of Organisational Performance to Inform the Future</i> | <i>35</i> |
| 4.3. Summary of Critical Issues informing the 2021/22 Annual Performance Plan..... | 39 |
| <i>ARC Sustainability And Turnaround Plan</i> | <i>39</i> |
| <i>The Financial Plan And Overview On The Key Ratios.....</i> | <i>43</i> |
| <i>Revenue And Cost Optimisation Initiatives</i> | <i>44</i> |
| <i>Critical Success Factors</i> | <i>49</i> |
| <i>Next Steps</i> | <i>50</i> |
| PART C: MEASURING OUR PERFORMANCE | 51 |
| 5. <i>INSTITUTIONAL PERFORMANCE INFORMATION</i> | <i>51</i> |
| 5.1. ARC Outcome 1: Increased Agricultural Production and Productivity | 52 |

| | |
|--|------------|
| ARC Outcome 1: Focus and Priorities and Contributing Divisions | 52 |
| ARC Outcome 1: Outputs, Output Indicators and Targets | 54 |
| ARC Outcome 1: Explanation of Planned Performance over the Medium-Term Period | 57 |
| ARC Outcome 1: Resource Considerations | 58 |
| 5.2. ARC Outcome 2: Sustainable Ecosystems and Natural Resources | 58 |
| ARC Outcome 2: Focus and Priorities and Contributing Divisions | 58 |
| ARC Outcome 2: Outputs, Output Indicators and Targets | 60 |
| ARC Outcome 2: Explanation of Planned Performance over the Medium-Term Period | 63 |
| ARC Outcome 2: Resource Considerations | 64 |
| 5.3. ARC Outcome 3: Improved Nutritional Value, Quality and Safety of Agricultural Products | 64 |
| ARC Outcome 3: Focus and Priorities and Contributing Divisions | 64 |
| ARC Outcome 3: Outputs, Output Indicators and Targets | 65 |
| ARC Outcome 3: Explanation of Planned Performance over the Medium-Term Period | 68 |
| ARC Outcome 3: Resource Considerations | 69 |
| 5.4. ARC Outcome 4: A Skilled and Capable Agriculture Sector | 69 |
| ARC Outcome 4: Focus and Priorities and Contributing Divisions | 69 |
| ARC Outcome 4: Outputs, Output Indicators and Targets | 72 |
| ARC Outcome 4: Explanation of Planned Performance over the Medium-Term Period | 76 |
| ARC Outcome 4: Resource Considerations | 77 |
| 5.5. ARC Outcome 5: Enhanced Resilience of Agriculture | 77 |
| ARC Outcome 5: Focus and Priorities and Contributing Divisions | 77 |
| ARC Outcome 5: Outputs, Output Indicators and Targets | 79 |
| ARC Outcome 5: Explanation of Planned Performance over the Medium-Term Period | 82 |
| ARC Outcome 5: Resource Considerations | 83 |
| 5.6. ARC Outcome 6: A High-Performing and Sustainable Organisation | 83 |
| ARC Outcome 6: Focus and Priorities and Contributing Divisions | 83 |
| ARC Outcome 6: Outputs, Output Indicators and Targets | 85 |
| ARC Outcome 6: Explanation of Planned Performance over the Medium-Term Period | 91 |
| 6. THE ARC FINANCIAL PLAN AND ANNUAL BUDGET FOR 2021/22 AND THE MTEF | 92 |
| 6.1. Projected Revenue For 2021/22 MTEF | 97 |
| 6.2. Projected Expenditure For 2021/22 MTEF | 98 |
| 6.3. Consolidated Resources Allocation | 99 |
| 6.4. Consolidated Financial Statements Overview | 100 |
| 7. MATERIALITY FRAMEWORK | 103 |
| ARC Materiality and Significance Framework | 103 |

| | | |
|-----|--|------------|
| 8. | UPDATED KEY RISKS..... | 105 |
| | <i>Top 10 Strategic Risk Exposures</i> | 105 |
| 9. | PUBLIC ENTITIES..... | 106 |
| 10. | INFRASTRUCTURE PROJECTS..... | 106 |
| | <i>Foot and Mouth Disease (FMD) vaccine production facility</i> | 106 |
| | <i>ARC Commercial Entity</i> | 108 |
| | <i>ICT Related Projects</i> | 109 |
| 11. | PUBLIC / PRIVATE PARTNERSHIPS | 110 |
| | PART D: TECHNICAL INDICATOR DESCRIPTIONS | 111 |
| | ANNEXURES TO THE ANNUAL PERFORMANCE PLAN..... | 139 |
| | ANNEXURE A: AMENDMENTS TO THE STRATEGIC PLAN | 139 |
| | ANNEXURE B: CONDITIONAL GRANTS | 139 |
| | ANNEXURE C: CONSOLIDATED INDICATORS..... | 139 |
| | ANNEXURE D: DISTRICT DEVELOPMENT MODEL | 139 |
| | ANNEXURE E: BOARD AND SUB-COMMITTEE CHARTERS..... | 139 |
| | ANNEXURE F: SWOT, PESTEL and STAKEHOLDER ANALYSIS | 140 |
| | <i>Updated SWOT Analysis – Informing 2021/22 Planning</i> | 140 |
| | <i>Updated PESTEL Analysis – Informing 2021/22 Planning</i> | 148 |
| | <i>Updated Stakeholder Analysis – Informing 2021/22 Planning</i> | 150 |

PART A: OUR MANDATE

In order to deliver on the priorities of the current government, and informed by instructing legislation and policy, the ARC has described its role through the 2020-2025 Strategic Plan as:

To conduct agricultural research and development and drive technology development and dissemination in order to:

- promote sustainability and equitable economic participation in the agricultural sector;
- promote agriculture development and growth in related industries;
- facilitate sector skills development and knowledge management;
- facilitate and ensure natural resource conservation;
- promote national food and nutrition security, and
- contribute to improved health and better quality of life.

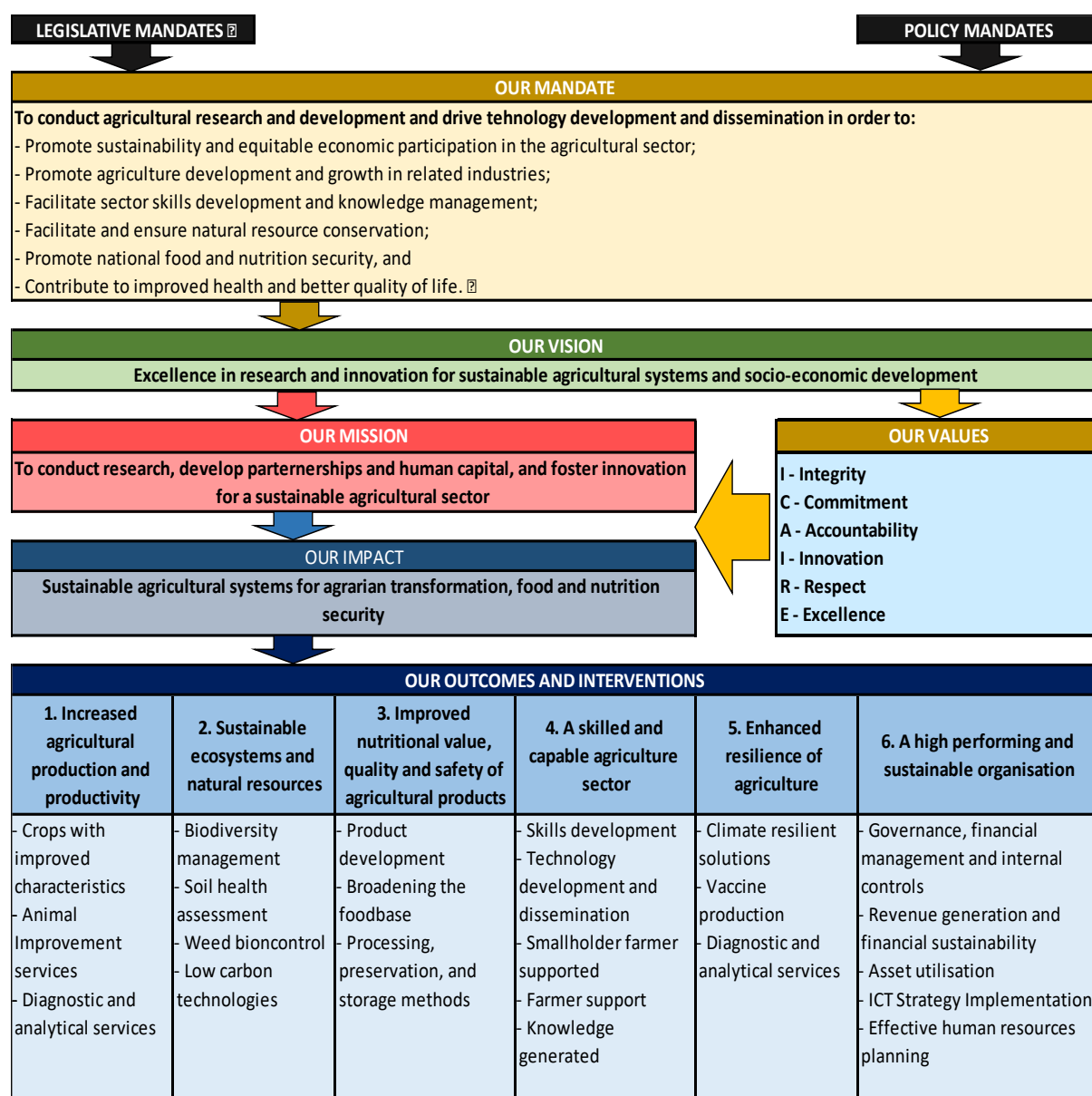
In line with this understanding, the Agricultural Research Council then articulates its strategic focus – its vision, mission and institutional values – for the period up to 2025 as follows:

| VISION | |
|---|--|
| Excellence in research and innovation for sustainable agricultural systems and economic development. | |
| MISSION | |
| To conduct research, develop partnerships and human capital, to foster innovation for a sustainable agriculture sector. | |

| VALUES | | |
|--------|-----------------------|--|
| Value | | Description - What it means in practice |
| I | Integrity | We conduct our business in a transparent, honest, truthful, consistent, and ethical manner to ensure we foster trust among our employees and stakeholders. |
| C | Commitment | We commit ourselves to live the values of the ARC. |
| A | Accountability | We honour our commitments towards our employees and stakeholders in a responsible and reliable manner, taking ownership of our work and decisions. |
| I | Innovation | We conduct our business in a manner that fosters innovation to improve the growth of the organisation and the agricultural sector. |
| R | Respect | We treat our colleagues and stakeholders with respect and dignity in an equitable manner whilst embracing diversity. |
| E | Excellence | We conduct our work in an efficient, effective, and professional manner to ensure we create the highest quality and value. |

| IMPACT STATEMENT | | |
|--|--|--|
| Sustainable agricultural systems for agrarian transformation, food and nutrition security. | | |
| OUTCOMES | | |
| OUTCOME 1: Increased agricultural production and productivity | OUTCOME 2: Sustainable ecosystems and natural resources | OUTCOME 3: Improved nutritional value, quality, and safety of agricultural products |
| OUTCOME 4: A skilled and capable agriculture sector | OUTCOME 5: Enhanced resilience of agriculture | OUTCOME 6: A high-performing and sustainable organisation |

The following is a visual representation of the strategic focus of the Agricultural Research Council for the period 2020-2025:



The ARC strategic focus to 2025

The above strategic framework and the six outcomes, in turn, inform the alignment of the delivery structure of the ARC and the development of outputs, output indicators, and annual and quarterly performance metrics, as outlined in the rolling annual performance plans for the period of the Strategic Plan.

The 2021/22 planning priorities, outputs, output indicators, annual targets and budget allocations for performance against the outcomes of the Strategic Plan are reflected in this APP.

1. UPDATES TO RELEVANT LEGISLATIVE AND POLICY MANDATES

1.1. UPDATED LEGISLATIVE MANDATES

There are no updates to the legislative mandates as outlined in the 2020/21 – 2024/25 Strategic Plan. In the subsequent years, updated information will be presented and discussed in this section, if necessary.

1.2. UPDATED POLICY MANDATES

In addition to the policy mandates contained in the 2020/21 2024/25 Strategic Plan, the updates to the policy mandates are outlined in the below table.

| NATIONAL FRAMEWORK | IMPLICATION |
|---|---|
| POPI Act⁶ | It sets some conditions for responsible parties to lawfully process the personal information of data subjects (both natural and juristic persons). |
| National Evaluation Policy Framework⁷ | Provides the basis for a minimum system of evaluation across government. Its main purpose is to improve the effectiveness and impact of government, by reflecting on what is working and what is not working and revising its programmes and policies accordingly |

2. UPDATES TO INSTITUTIONAL POLICIES AND STRATEGIES

The table below provides updates to the institutional policies and strategies and are outlined below for the 2021/22 Annual Performance Plan.

| UPDATED /NEW INSTITUTIONAL POLICIES AND STRATEGIES | IMPLICATION |
|--|--|
| Interim HR Procedures for ARC in response to COVID-19 | The procedure provides additional temporary measures and provisions in compliance with Disaster Management Act ⁸ . The procedures were to assist the ARC in the management of all scenarios relating to COVID-19. |
| COVID-19 Working from Home Procedures | The procedure outlines the circumstances under which the ARC will allow employees to work from home during the COVID-19 pandemic and assist with the actions required to facilitate the working from home arrangement. |
| Organisational Performance Information Management | To guide the development, recording and reporting of the ARC performance information. |
| Enterprise Risk Management Strategy, Framework & Process | To guide ARC in the management of risks within a complex and ever changing environment. |

⁶ Protection of Personal Information Act 4 of 2013. Available: <https://www.gov.za/documents/protection-personal-information-act#>

⁷ National Evaluation Policy Framework. Available: <https://www.gov.za/documents/national-evaluation-policy-framework>

⁸ Disaster Management Act 57 of 2002: Available: <https://www.gov.za/documents/disaster-management-act>

| UPDATED /NEW INSTITUTIONAL POLICIES AND STRATEGIES | IMPLICATION |
|--|---|
| Combined Assurance Value Chain Plan 2020/2021 Financial Year | To highlight the relevant high-risk areas and assurance by management, internal audit, council, sub-committees, external audit including other consultants. |
| ICT Business Strategy | Approved and implemented |
| ICT Governance Framework | Approved and implemented |
| Accounts Payable Policy | Strengthening of Financial Internal Controls and ensuring alignment to prevailing legislation and standards |
| Asset Management Policy | |
| Biological Assets Policy | |
| Cash & Investment Management Policy | |
| Costing Framework | |
| Credit Management Policy | |
| Inventory Management Policy | |
| Payroll Administration Policy | |
| Petty Cash Policy | |
| Pricing Framework | |
| Project Accounting Policy | |
| Subsistence & Travel Allowance Policy | |
| Supply Chain Management Policy | |
| Irregular, Fruitless and Wasteful Expenditure Policy | |
| Contract Management Policy | |

3. UPDATES TO RELEVANT COURT RULINGS

There are no court judgements or rulings, which have a material and/or direct bearing on the mandate and/or core operations of the ARC.

PART B: OUR STRATEGIC FOCUS

4. SITUATIONAL ANALYSIS

4.1. EXTERNAL ENVIRONMENT ANALYSIS

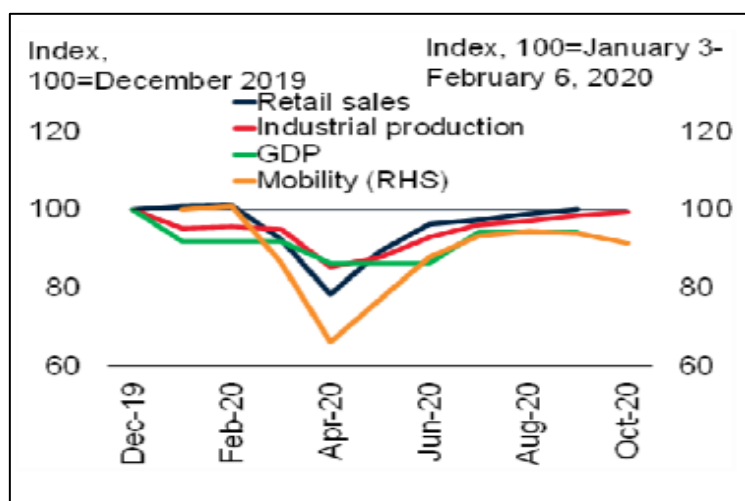
GLOBAL ECONOMIC OUTLOOK

The adverse effects of the COVID-19 pandemic were largely felt in the emerging markets and developing economies (EMDEs), in particular on human capital and investments, continue to pose a risk to potential growth and key development goals in global economies. However, it is expected that global economies will strengthen beyond the forecast horizon due to vaccination support, partial easing of the national lockdown, improved trade and business confidence. However, it will not be business as usual in the near future as further outbreaks (second and possibly third waves) of the coronavirus and delays in vaccination programmes continue to threaten expected recovery. Again, more severe and persistent pandemic effects on potential output are expected, “as output remains dampened by lingering risk aversion on the demand side and the effects of diminished physical and human capital accumulation on labour productivity” (World Bank, 2021⁹). This lacklustre outlook is further exacerbated by a tightened financial space due to high debt levels and weakened growth in most economies. A pessimistic scenario in which new cases of Covid-19 continue to increase, as well as other logistical issues related to the release and acceptance of the vaccine, may further dampen recovery prospects.

EMERGING MACRO ECONOMIC FACTORS AND TRENDS

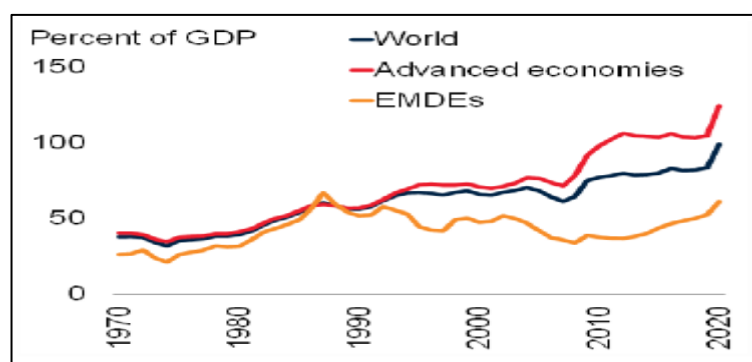
The global economy contracted by 4.3% in 2020 and was 0.9 percent lower than the June 2020 projections. Global economic growth slowly recovered in mid-2020, largely due to increased business activities as well as trade in the goods sector. However, the resulting rebound has been dampened by the continued re-emergence of pandemic cases. The services sector, in particular the international tourism, has remained depressed. Furthermore, the financial sector is also not spared by the pandemic, as debt has also surged to highest levels, putting most countries at risk of financial crises.

⁹ World Bank. 2021. Global Economic Prospects, January 2021. Washington, DC: World Bank. doi:10.1596/978-1-4648-1612-3



Global activity indicators

Source: World Bank, 2021

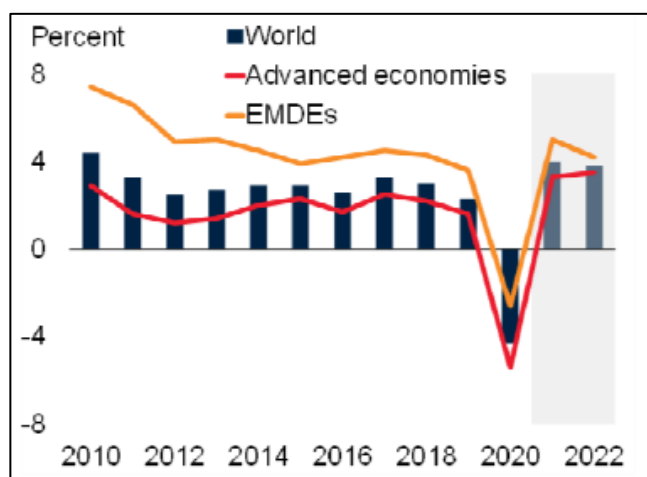


Global economies trend in government debt

Source: World Bank, 2021

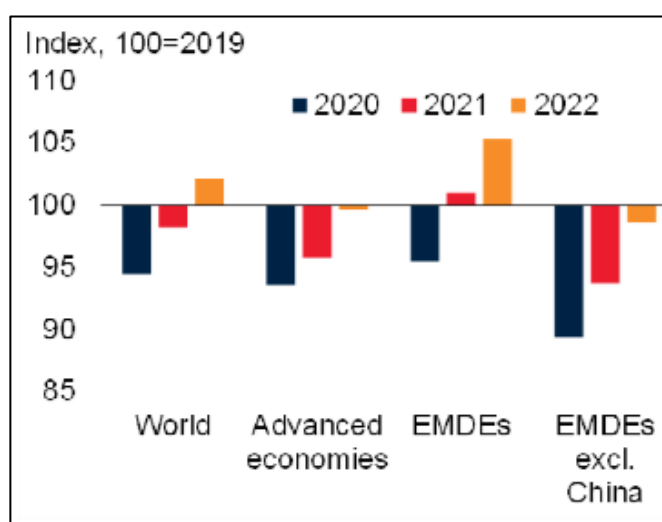
A baseline projection of 4% on global GDP growth is expected in 2021. It is believed, however, to be 5.3% below the pre-COVID-19 projections (World Bank, 2021¹⁰). The projection for GDP growth of 2022 is estimated to be 3.8%, but 4.4% below the pre-COVID-19 projections. Advanced economies are projected to rebound at 3.3% in 2021 and 3.5% in 2022, while the EMDEs have an aggregate growth rate of 5% (2021), and are projected to decline to 4.2% in 2022. In the worst-case scenario where COVID-19 continues to rise, a subdued global growth is expected to rise to 1.6% in 2021, at 2.5% in 2022 (World Bank, 2021), with an even more serious scenario likely to lead to negative global growth in 2021. Global investment also decreased, especially for the EMDEs, due to a deterioration in business confidence as a result of the pandemic, which adversely affected longer-term productivity.

¹⁰ World Bank. 2021. Global Economic Prospects, January 2021. Washington, DC: World Bank. doi:10.1596/978-1-4648-1612-3.



Global growth over 2010-22

Source: World Bank, 2021



Investment levels over 2020-22

Source: World Bank, 2021

The expected global economic and investment growth is, however, predicated on tighter fiscal space interventions, appropriate COVID-19 management, and the long-awaited vaccination rollout to reduce the spread of the virus, and these interventions could possibly trigger an increase in consumer confidence that is sufficient to stimulate demand for goods and services, thereby jump-starting the economy.

SOUTH AFRICAN ECONOMIC OUTLOOK AND EMERGING TRENDS

Economic outlook has been and continues to be threatened by the COVID-19 pandemic, which has put pressure on state finances (Quantec, 2021¹¹). There are also growing concerns regarding uncertainties around government's post COVID-19 economic recovery strategy. The pandemic also dampened

¹¹ Available at: <https://www.quantec.co.za/post/3770/south-africa-economic-review-and-forecast/>

confidence in the economy, which continues to have an impact on economic activities. As such, business sentiment remains entrenched in negative territory and is likely to hold back capital spending (Focus Economics, 2020¹²). After experiencing negative growth due to the pandemic, the economy recovered in Q3 of 2020/21, coinciding with easing of COVID-19 restrictions (StatsSA, 2020¹³). This was largely due to almost all industries recording an increase in economic activity, when compared to Q2 of 2020/21.

South Africa GDP growth rates: 2018-2020

| YEAR | QUARTER | YEAR-ON-YEAR % INDIVIDUAL QUARTERS | YEAR-ON-YEAR % FOR YEAR-TO DATE | QUARTER-ON-QUARTER SEASONALLY ADJUSTED | QUARTER-ON-QUARTER % SEASONALLY ADJUSTED AND ANNUALISED (HEADLINE RATE) |
|------|---------|--|---------------------------------------|--|--|
| 2018 | 1 | 0.7 | 0.7 | -0.7 | -2.7 |
| | 2 | 0.1 | 0.4 | -0.1 | -0.5 |
| | 3 | 1.3 | 0.7 | 0.6 | 2.6 |
| | 4 | 1.1 | 0.8 | 0.3 | 1.4 |
| 2019 | 1 | 0.0 | 0.0 | -0.8 | -3.2 |
| | 2 | 0.9 | 0.5 | 0.8 | 3.3 |
| | 3 | 0.1 | 0.4 | -0.2 | -0.8 |
| | 4 | -0.5 | 0.2 | -0.4 | -1.4 |
| 2020 | 1 | 0.1 | 0.1 | -0.4 | -1.7 |
| | 2 | -17.5 | -8.8 | -16.6 | -51.7 |
| | 3 | -6.0 | -7.9 | 13.5 | 66.1 |

Source: StatsSA, 2020¹⁴

Overall, the GDP at market prices increased by 66.1% in Q3, compared to -51.7% (Q2) and -1.7% in Q1. Generally, the industry recovered largely in Q3, this is mainly attributed to the relaxation of restrictions that are in place and associated with COVID-19 outbreak. However, while the rebound may seem impressive, the economy was still 5.8% smaller than it was at the end of 2019 (StatsSA, 2020). The table below disaggregates GDP growth by economic sector.

South Africa economic sectors' GDP growth: 2019-2020

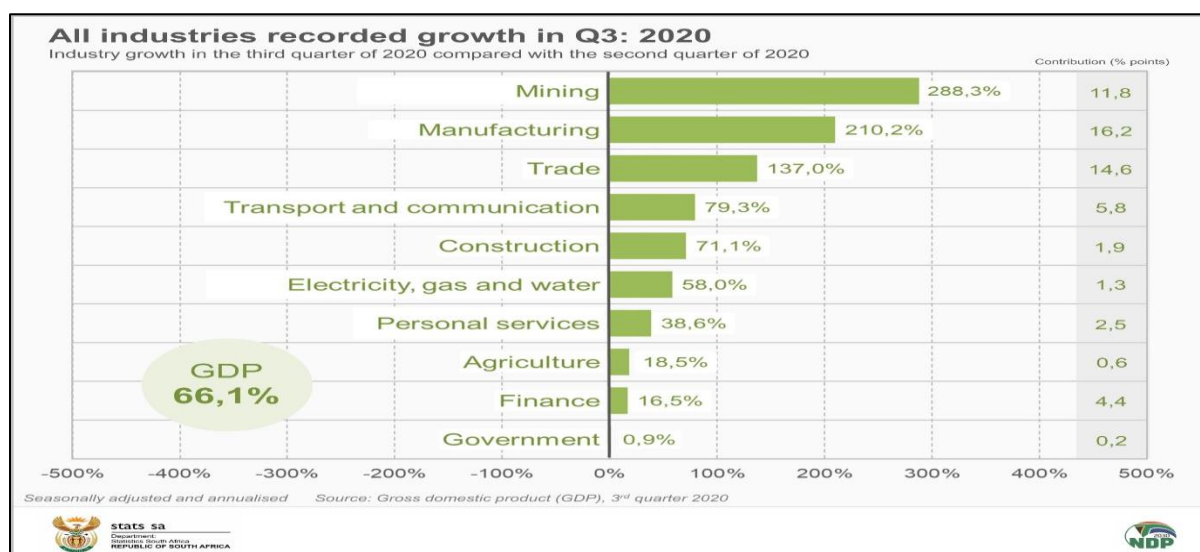
| | Agriculture, Forestry and Fishing | Mining | Manufacturing | Electricity, gas and water | Construction | Trade, catering and accommodation | Transport, storage and communication | Finance, real estate and business services | General government services | Personal services | Total value added at basic prices | Taxes less subsidies | GDP at market prices |
|-------------------|-----------------------------------|--------|---------------|----------------------------|--------------|-----------------------------------|--------------------------------------|--|-----------------------------|-------------------|-----------------------------------|----------------------|----------------------|
| Percentage points | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | |
| Q1 | -0.4 | -0.8 | -1.1 | -0.2 | -0.2 | -0.5 | -0.4 | 0.2 | 0.4 | 0.1 | -2.9 | -0.3 | -3.2 |
| Q2 | -0.1 | 1.2 | 0.3 | 0.1 | 0.1 | 0.5 | 0.0 | 0.9 | 0.5 | 0.0 | 3.1 | 0.2 | 3.3 |
| Q3 | -0.1 | -0.5 | -0.6 | -0.1 | -0.2 | 0.4 | -0.5 | 0.3 | 0.4 | 0.0 | -0.8 | 0.0 | -0.8 |
| Q4 | -0.2 | 0.1 | -0.2 | -0.1 | -0.2 | -0.5 | -0.6 | 0.6 | -0.1 | 0.0 | -1.2 | -0.3 | -1.4 |
| 2020 | | | | | | | | | | | | | |
| Q1 | 0.7 | -1.7 | -1.1 | -0.1 | -0.2 | -0.1 | 0.0 | 0.8 | 0.2 | 0.0 | -1.4 | -0.3 | -1.7 |
| Q2 | 0.3 | -5.8 | -10.8 | -0.7 | -3.0 | -10.5 | -6.8 | -6.6 | -0.1 | -1.6 | -45.6 | -6.2 | -51.7 |
| Q3 | 0.6 | 11.8 | 16.2 | 1.3 | 1.9 | 14.6 | 5.8 | 4.4 | 0.2 | 2.5 | 59.3 | 6.9 | 66.1 |

Source: StatsSA, 2020

¹² FocusEconomics. 2020. South Africa Economic Outlook. Available at: <https://www.focus-economics.com/countries/south-africa>

¹³ StatsSA. 2020. Gross Domestic Product. *Third Quarter 2020*. Statistical Release, P0441. Available at: <http://www.statssa.gov.za/publications/P0441/P04413rdQuarter2020.pdf>

The economic sectors that largely drove growth were the manufacturing (210.2%), trade, catering and accommodation (137%) and mining (288.3%). The agriculture, forestry and fisheries sector grew by 18.5%. All the ten manufacturing sub-sectors contributed positively to growth in Q3, while the agriculture sector growth was mainly driven by increased production of field crops, horticultural & animal products (StatsSA, 2020). The figure below shows the percentage contribution of each economic sector to the overall GDP in 2020.



South Africa GDP growth and economic sector contribution (%)

Source: StatsSA, 2020¹⁵

Economic growth is expected to recover to 3.3% in 2021, although 0.7 percentage points lower from the baseline forecasts; and is projected to grow by 1.7 percentage points above the baseline projections for 2022 (StatsSA, 2020). The 2021 growth projection is attributed to reviving of domestic and foreign demand. The weak growth as 2021 starts is largely attributed to the lasting impacts of COVID-19 as some restrictions are in place and are expected to linger a bit longer. In addition, high unemployment and persistent power-supply disruptions hovering over the South African economy are also envisioned to dampen prospects of economic activities (World Bank, 2021, Focus Economics, 2020). This is also further compounded by debt sustainability concerns. For example, a fiscal deficit of -14.6% and 81.8% gross debt of GDP was projected in 2020, versus previous projections of a fiscal deficit of -6.8% of GDP and debt at 65.6% of GDP for 2020/21 (Investec, 2020¹⁶). The debt burden is expected to even rise to 87.4% by 2023/24, thus deteriorating South Africa's ability to repay its debt.

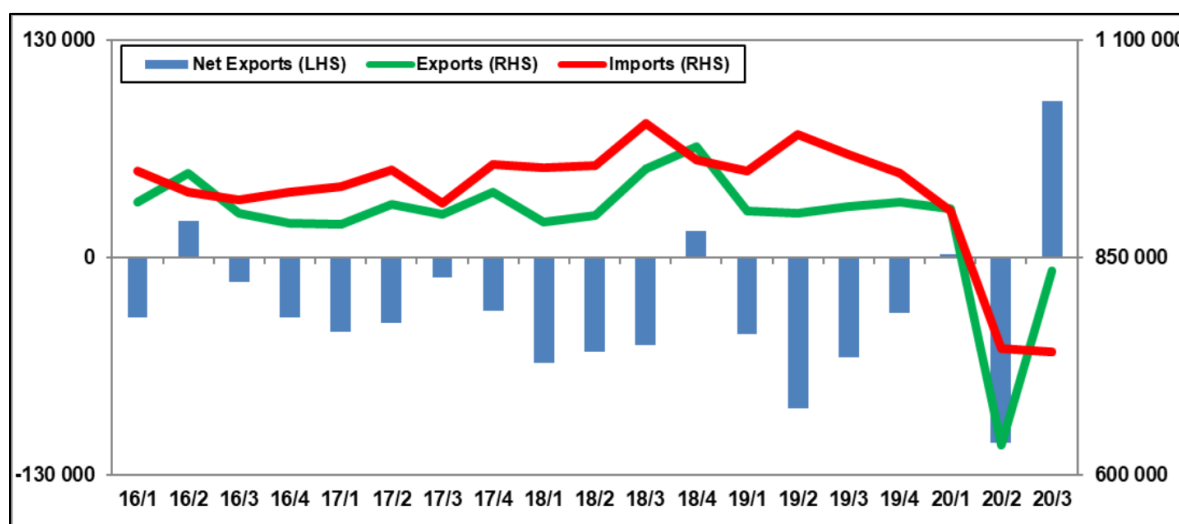
¹⁵ StatsSA. 2020. Gross Domestic Product. *Third Quarter 2020*. Statistical Release, P0441.

Available at: <http://www.statssa.gov.za/publications/P0441/P04413rdQuarter2020.pdf>

¹⁶ The Investec View. 2020. Tough times ahead of SA economy.

Available at: https://www.investec.com/en_za/focus/economy/sa-economics.html

The net exports have also contributed positively to GDP - expenditure growth in Q3 of 2020/21.



Exports and imports of goods and services, South Africa

Source: StatsSA, 2020

Exports grew by 201.4%, driven by an increase in vehicles trade, precious stones and metals, transport equipment, machinery and base metals (StatsSA, 2020). On the other hand, there was a decrease of imports by 1.6%, largely driven by decreases in chemical products, textiles, prepared foodstuffs, tobacco products and beverages. The beverages category includes both alcoholic and non-alcoholic drinks and wine features prominently in this category as a major South African export. The total exports of wine decreased by 24% to 320 million litres in 2019, mainly as result of the three-year drought and it is expected that the trend continued in 2020 largely owing to Covid-19 restrictions on the transportation of alcohol and reduced port capacity.

GLOBAL OUTLOOK FOR AGRICULTURE

The COVID-19 pandemic disrupted agricultural and food supply chains in unprecedented ways and the resultant pressures continue to be experienced in both developed and emerging and developing economies. The disruptions included bottlenecks in the input industry and marketing of products, and reduced agriculture production and food processing and changes in patterns of food and food services demand (OECD/FAO, 2020¹⁷). In a nutshell, trade was severely curtailed between countries and regions (export and imports) due to movement restrictions and reduced capacity at the major ports, largely due to limited container availability and reduced number of workers reporting for work. At the research level, the pandemic disrupted research trials that depend on agricultural seasons, and most laboratories closed for months as workers stayed home. The Global Agricultural Productivity report for 2020¹⁸ estimated an increase in the number of people at the risk of extreme hunger from 167 million to 235 million due to the pandemic.

Despite the effects of the pandemic so far experienced, and anticipated due to the continued lockdown in some regions of the world, there are no major structural changes in the demand for food expected in the next decade at global level. Population growth remains the main driving force for increased demand for food, whilst countries will experience different trajectories in demand for commodities. Increased consumer incomes and changing perceptions about health and the environment in developed countries

¹⁷ Available: <https://www.oecd.org/publications/oecd-fao-agricultural-outlook-19991142.htm>

¹⁸ Available: <https://globalagriculturalproductivity.org/2020-gap-report/>

will induce a downward demand in red meat, whilst increased incomes in developing countries will drive up the demand for protein. Fats are projected to account for the highest growth rate (9%) in calories over the coming decade. Staples, on the other hand, are expected to experience a decline in their share of the food basket (OECD/FAO, 2020¹⁹).

With the land frontier having been reached in most regions, it is expected that increase in output will be achieved through yield improvements that are driven by increased factor productivity growth. The gains from intensive input use, new cultivars and better production practices are expected to increase agricultural sustainability (GAP report, 2020²⁰). Global agriculture faces additional challenges to COVID-19. For Africa, the locust invasion decimated yields in some countries. In addition, the increased resistance to antimicrobial substances and regulatory limitations to some breeding techniques coupled with climate change related pressures have increased the pressures on agriculture and food sectors (OECD/FAO, 2020²¹). Together with digital innovations in the sector, these factors will determine strategic intentions for R&D organisations going into the future.

The change in Global climatic patterns are going to have a huge impact on climate sensitive sectors like agriculture. According to the World economic forum global risk report 2020, issues of extreme weather/natural disasters, climate action failure, natural resources crisis, human environmental damage, biodiversity loss have consistently been in the top five of the identified global risks. This view is shared by IPCC's 5th Assessment Report²² which indicates some of the challenges (Figure below) that are going to be faced by communities in Southern Africa due to increasing temperatures, high variability of rainfall, increased frequency of climate-related disasters and elevated vulnerability over much of Sub-Saharan Africa. The agricultural sector in South Africa has also shown its susceptibility to changing climate as evidenced by recent fluctuations of rain-fed crop production, increasing incidences of pests and diseases, high variability of available water for agriculture and increased vulnerability of livestock productivity systems. This has led to concerns regarding issues of food security especially for the people living in rural areas and parts of the country already recognized as having high food poverty rate.

¹⁹ Available: <https://www.oecd.org/publications/oecd-fao-agricultural-outlook-19991142.htm>

²⁰ Available: <https://globalagriculturalproductivity.org/2020-gap-report/>

²¹ Available: <https://www.oecd.org/publications/oecd-fao-agricultural-outlook-19991142.htm>

²² Available: <https://www.ipcc.ch/assessment-report/ar5/>

Global Risks Landscape 2021



Top Global Risks by Likelihood



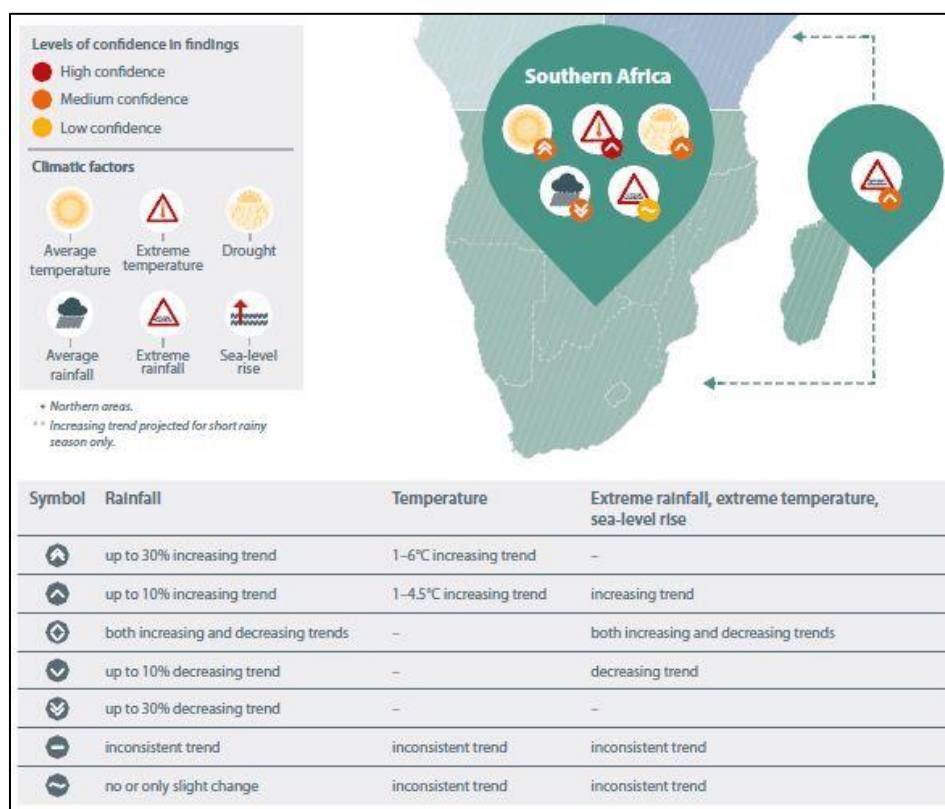
Top Global Risks by Impact



■ Economic
 ■ Environmental
 ■ Geopolitical
 ■ Societal
 ■ Technological

WEF Global risk perception survey 2021²³

²³ Available: <https://www.weforum.org/reports/the-global-risks-report-2021>

IPCC's 5th Assessment Report²⁴

SOUTH AFRICAN AGRICULTURAL OUTLOOK

The performance of the agricultural sector in 2020, which witnessed growth in the first three quarters, was in sharp contrast to other sectors of the economy that contracted in the first two quarters mainly due to COVID-19 lockdowns. Due to strong agricultural export growth, a good rainy season, an expected good crop harvest and high commodity prices, it is expected that final figures will show positive growth for agriculture across all quarters. A comparison of Q3 performance from 2018-2020 showed annual increase across all sectors i.e. horticulture, field crops and animal products. Field crops showed 34% growth in value of production for 2020 when compared with Q3 2019 figures (BFAP, 2020²⁵). Notable changes in performance of specific subsectors include an increased demand for citrus crops due to pandemic related demand for Vitamin C (BFAP, 2020). This growth of citrus demand is likely to be sustained in 2021 and possibly beyond.

South Africa's 2020 wine exports reached 319-million litres despite market challenges. South Africa's wine export volumes of 2020, which amount to 319.2 million litres, followed a similar pattern of a challenging 2019, despite a five-week-long ban on exports and challenges at the Cape Town Port terminal owing to COVID-19. This performance ensues from a good 2020 harvest and vineyard recovery following the drought experiences in South African winegrowing regions from 2015 through to 2018.

According to Engineering News, the overall value of the country's wine exports increased by 7.7% to R9.1-billion, of which packaged wine exports' value grew by 8.3%. Countries which showed good growth in value include the UK (28%), the Netherlands (19%), the US (12%) and Sweden (17%). The wine industry is a

²⁴ Available: <https://www.ipcc.ch/assessment-report/ar5/>

²⁵ Available: <https://www.bfap.co.za/bfap-baseline-2020/>

significant contributor to the South African economy through its backwards and forward linkages and job creation.

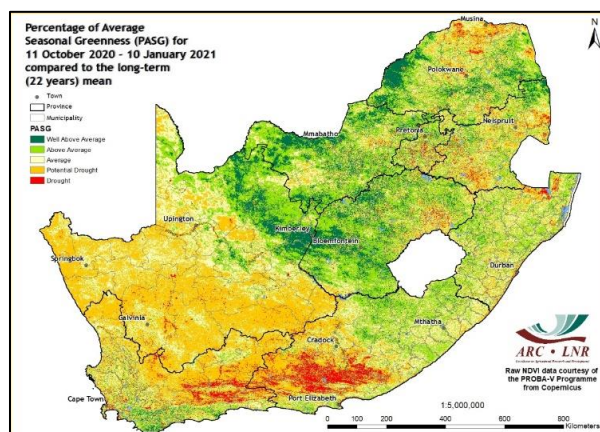
The sector's growth momentum is expected to continue in 2021, with adequate supplies of grains, oilseeds and horticulture crops expected for the country. The high yields and positive prospects for the sector will likely contain food and overall consumer inflation, and enhance the sector's contribution towards the GDP outcomes in the country. Consumption trends, which were on a changing trajectory for the middle and high-income class, with emphasis on health and safety, and environmental concerns, may witness a temporary change due to income pressures caused by the COVID-19 pandemic. Similarly, grain consumption, which forms part of basic foods, could also see a higher share in the consumer food basket due to the pandemic induced decline in disposable incomes for households.

It is expected that South Africa and the Southern Africa region in general will experience a good harvest for 2020, although the recent Cyclone Eloise has decimated yields in certain parts of the region. This is the case for almost all commodities such as maize, sunflower seed, sorghum, groundnut and soybeans. According to the Crop Estimates Committee Report of 26 November 2020, the 2020 harvest for maize is expected to be 37% higher than the harvest 2019. More than 80% of the harvest is expected to come from Mpumalanga, the Free State, and the North West. No significant changes were expected for sunflower and soybean yields.

Despite concerns about the economy's post COVID-19 recovery, the positive outlook for the sector presents several opportunities for agricultural R&D. In line with the global trends in meeting increased demand for food driven by population growth, agricultural R&D in South Africa is still expected to contribute towards increased yields and reduced post-harvest losses. An increasingly important focus of research is in the area of diseases transmitted between animals and humans (zoonotic diseases) and diseases transmitted through food (food-borne pathogens) and on the development of vaccines for various livestock diseases. There is room for the development of digital innovations in the agricultural sector in South Africa, with particular emphasis on innovations that address constraints smallholder farmer and are suitable for the uptake of farmers. The ARC has potential and opportunities to make use of its farms for commercial production in a variety of high-value commodities.

CURRENT AND FUTURE CLIMATE CONDITIONS WITH IMPLICATIONS ON AGRICULTURAL PRODUCTION

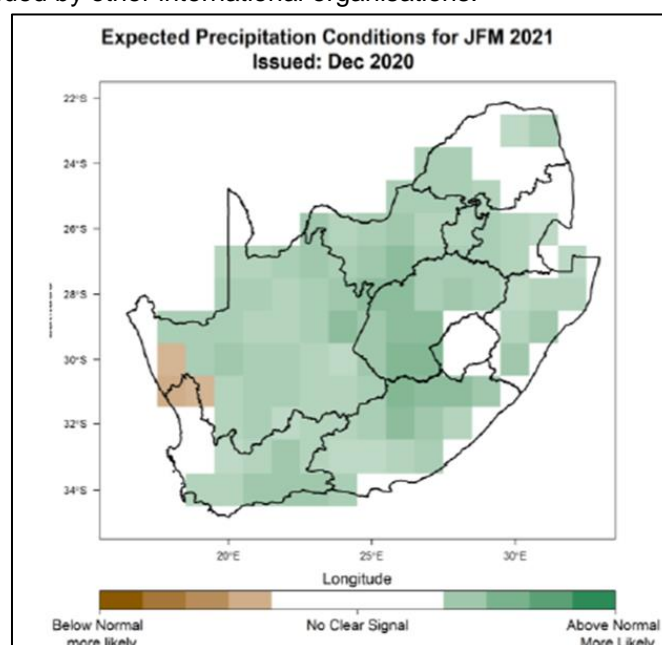
The current La Niña event is expected to continue until the end of our current summer growing season. There exists a positive statistical relationship between La Niña and the cooler, wetter summers over the main grain-producing areas – supportive of production. Due to high international grain prices since winter of 2020, the Crop Estimates Committee estimates that the area planted was relatively large. In addition, the weather conditions have supported production since October, covering the main planting window in all major production areas. Thus far, summer 2020/2021 is characterized by above-normal rainfall over most areas and also very little in terms of extreme maximum temperatures, supporting crop development. At this stage, somewhat drier conditions over parts of Mpumalanga may result in a negative trend for yellow maize production, but white maize production areas further west are experiencing sufficient to abundant rainfall. The positive effect of normal to above-normal rainfall since early summer is seen in the above-average cumulative vegetation activity occurring in large parts of the country, as indicated by the green areas in the map below. Most of the summer rainfall, especially in western maize-producing areas in the central parts of the country, experienced above-average vegetation activity.



Percentage of Average Seasonal Greenness (season: 11 October 2020 – 10 January 2021), showing areas with above-average vegetation activity in green.

The wetter conditions experienced since early summer, particularly the abnormally high rainfall totals in the central parts of the country, are in line with expectations as per seasonal forecast given the ongoing La Niña. Current seasonal forecasts remain positive with regard to sufficient rainfall and near-normal maximum temperatures towards the end of the summer – which is expected during the La Niña conditions. However, cloudy, wet conditions during the February – March period can sometimes hinder the final stages of crop development.

The figure below shows the latest seasonal forecast for rainfall for the rest of the summer (January – March period), issued by the South African Weather Service²⁶. The forecast is consistent with other seasonal forecasts issued by other international organisations.



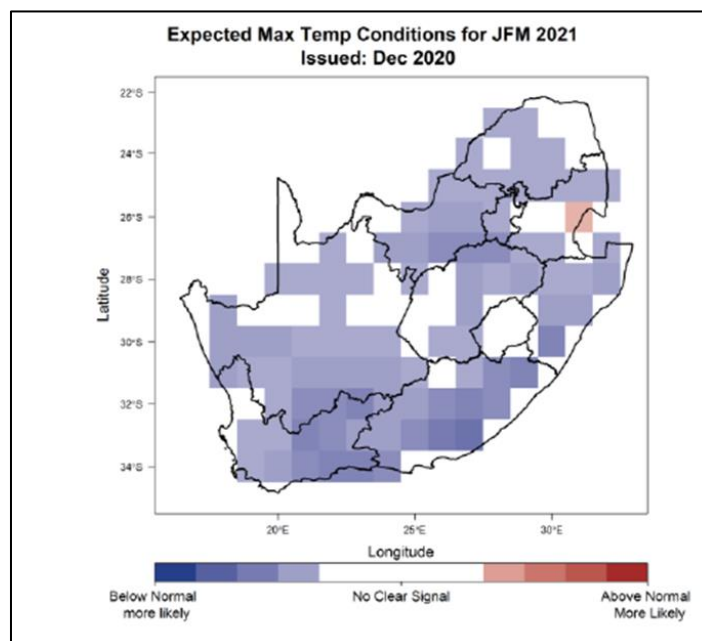
January-February-March 2021 (JFM) seasonal precipitation prediction by the South African Weather Service. The map indicates the highest probability from three probabilistic categories namely Above-Normal, Near-Normal and Below-Normal.

As seen above, more above-normal rainfall is expected during the remainder of the current summer, with the largest probability of above-normal precipitation over the central parts of the country, where the

²⁶ Available: <https://www.weathersa.co.za/>

largest positive anomalies were also observed between October 2020 and the beginning of January 2021.

Coupled with above-normal rainfall, temperatures are expected to decrease slightly over the summer rainfall region – most likely due to cloud cover and influx of moisture into the subcontinent. Seasonal forecasts indicate mostly near normal to below normal maximum temperatures for the remainder of the summer, see figure below.



January-February-March 2021 (JFM) seasonal maximum temperature prediction by the South African Weather Service. The map indicates the highest probability from three probabilistic categories namely Above-Normal, Near-Normal and Below-Normal.

Normal to below-normal maximum temperatures during this middle to late part of the summer are supportive of crop production – as the optimal temperatures for maize-production (tasselling and grain fill stages) are slightly lower than what is usually experienced over the interior. Lower temperatures late in the summer can hamper production, but this is usually a bigger problem if planting of crops is late – unlike the current summer when very favourable conditions occurred during the normal planting window.

Seasonal forecasts are uncertain for the winter period (May to August) in South Africa, thus predictions of rainfall, way before the winter growing season starts over the Western Cape, is not recommended. Dam levels in the Western Cape are also relatively close to capacity – owing to the relatively high rainfall, especially in the 2020 winter. However, given a long-term trend related to climate change in the climate system over the Southern Ocean, somewhat warmer, drier winters may become more prevalent in future – and this trend may indeed increase the chances for the coming winter to be somewhat drier than expected given natural climate variability.

Decadal-scale forecasting is non-existent – but research in this field will make it possible in the future to carry out meaningful assessments of the expected conditions beyond the current summer. In view of the current seasonal forecast capability and scope, it is impossible to make a scientifically based assessment of the expected conditions for the period following the current summer. It can be expected though that the tendency seen for a very late start to the rainy seasons that has been interrupted during the current summer, may continue to be absent at the end of 2021 – and we may see a normal start to the rainy season. It is rare for two summers in a row to be equally wet, and it can be expected that sometime during the coming summer, the climate system may drift to a state of somewhat drier conditions in South Africa, associated possibly with an El Niño event, somewhere during the coming

2021/22 or the following summer. Given abundant rainfall during the current summer over many areas, it can be expected, although the situation with regard to availability of water in large reservoirs by early next summer will be relatively favourable.

IMPLICATIONS OF COVID-19 OUTBREAK

Impact of COVID-19 on the Country

The national COVID-19 situation is constantly evolving. The first case of COVID-19 was confirmed on the 5 March 2020 and on 15 March 2020, the President Cyril Ramaphosa declared a national state of disaster, and announced measures such as immediate travel restrictions and the closure of schools from 18 March 2020. The National Coronavirus Command Council was established on 17 March 2020 and a week later on 23 March 2020 a national lockdown to take effect from 27 March 2020 was announced. Lockdown level 5 was a response to the now raging first wave of the pandemic. A gradual and phased easing of the lockdown restriction was announced on the 1 May 2020, lowering the national alert level to level 4, then to level 3 on 1 June and to level 2 on 17 August 2020. Following a dramatic drop in the number of cases, the alert level was lowered to level 1 on 21 September 2020.

In December 2020, the country experienced a second wave of COVID-19 infections mainly caused by the new variant 501Y.V2. The lockdown was tightened from adjusted level 1 to adjusted level 3 starting on 29 December 2020. The emergence of new variants of concern (VOCs) of the SARS-CoV2 virus, the delay in obtaining enough vaccines for the country and the vaccination of at least two thirds of the population to achieve herd immunity, and the impending winter conditions are all expected to continue to fuel the transmission of the SARS-CoV2 virus.

A further concern is that there has recently been dramatic shifts in vaccine confidence and conspiracy theories that threaten the success of approved COVID-19 vaccines as well as the likelihood of achieving herd immunity. As of January 2021, South Africa had the highest number of confirmed COVID-19 cases in Africa and the fifteenth highest number of confirmed infections worldwide, but with a relatively low death rate.

The lockdown restrictions due to COVID-19 have adversely affected the country's economy. A report from StatsSA²⁷ indicates that during April, May and June, when the country operated under widespread lockdown restrictions in response to COVID-19, the economy suffered a significant contraction with Gross Domestic Product (GDP) falling by just over 16% resulting in an unprecedented annualised growth rate of -51%. There is no quick fix to the COVID-19 situation; the economic performance of the country is expected to remain depressed in the short to medium term.

Impact of COVID-19 on the Sector

The agricultural sector was one of the few that recorded appreciable growth figures in Q3 of 2020 when lockdown restrictions were eased. This was mainly due to its classification as an essential services sector. Even then, strict travel restrictions imposed on people's movements across the country during the lockdown levels 4 and 5 to contain the spread of the virus, impeded access to economic activities, limited the ability of agricultural stakeholders to interact with other key sectors in the full implementation of their farming activities. This was despite the fact that the agricultural sector was identified as an essential business sector. As a result, the sector will not fully recover the losses suffered during the COVID-19. The impact of the reduced downstream demand for the products of the sector due to the lockdown conditions also continues to affect the productivity of the sector e.g. impact of reduced production of grapes as a result of the ban on the sale and consumption of wine. Barley growers are

²⁷ Available: <http://www.statssa.gov.za/?p=13224>

facing similar challenges. In the last few weeks, South African Breweries has announced a cumulative divestment of close to R5 billion from the sector, citing restrictions on the sale and consumption of beer under various lockdown levels, which have all but stopped the sale of alcohol. This decision will have significant impact on the sector's barley growers, just as the wine industry is also experiencing its effects.

Impact of COVID-19 on the ARC

A significant decrease in diagnostic and research activity due to COVID-19 resulted in a loss of revenue for the ARC. Operating at reduced capacity, employee morbidity and mortality, inability to conduct outdoor research that required the involvement of critical stakeholders, and budget cuts redirected to COVID-19 activities across the country were factors that contributed to poor performance. The mitigation measures taken to address some of the above constraints, although well intentioned will not be sufficient to address the challenges brought about by COVID-19. The Crops division will experience a significant impact as the demand for crops used in production of beer and wine has fallen, while samples submitted to the Animal sciences division have also witnessed a significant drop resulting in reduced revenue for the organisation.

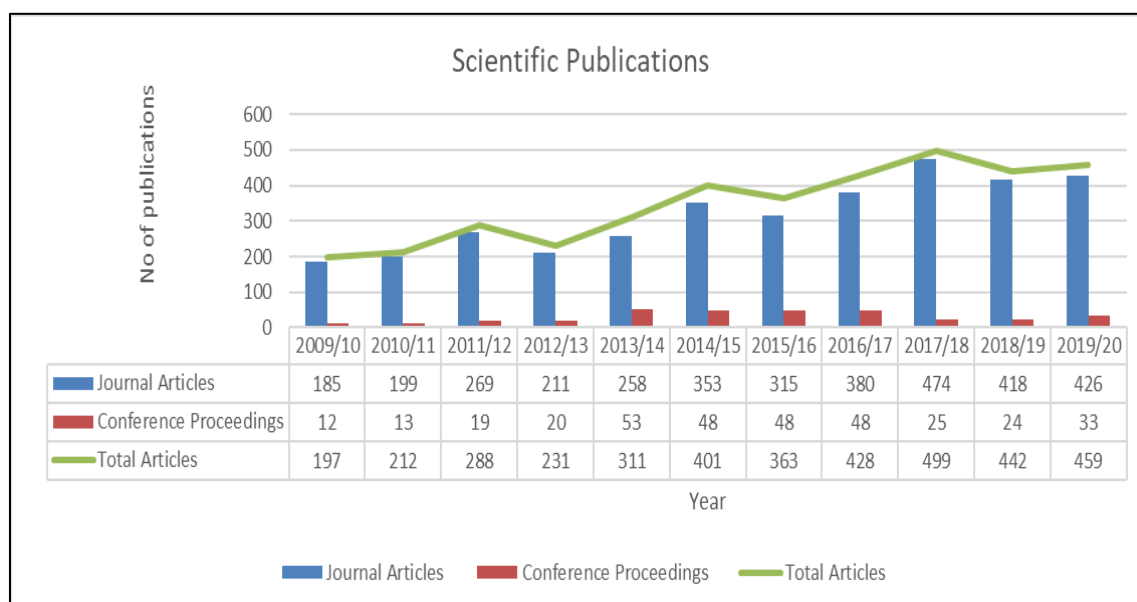
The down side of COVID-19 impact on the ARC includes safety concerns and anxieties for its employees, work from home challenges, morale and mental health of the employees and the negative effects of downsizing and even eminent layoffs of some employees. The VOCs threaten to perpetuate the pandemic for some time leading to pandemic fatigue. The closure of firms that conduct business with the ARC and the resulting decline in consumer purchasing power will inevitably affect the demand for the products and services offered by the ARC. With consumers struggling to make ends meet, entities that are of a public good like the ARC suffer a two-edged sword, of reduced funding from Treasury and reduced demand for their products which affects their ability raise external income.

Ironic as it might sound, the ARC can still benefit from the changes brought about by COVID-19. The organisation can leverage its adaptability strength to become more flexible and efficient by switching to digital operations, to have a lean workforce and to benefit from reduction in the operating costs by means of embracing the benefits of remote work for its employees. The organisation can also submit proposals to access and participate in COVID-19 research.

4.2. INTERNAL ENVIRONMENT ANALYSIS

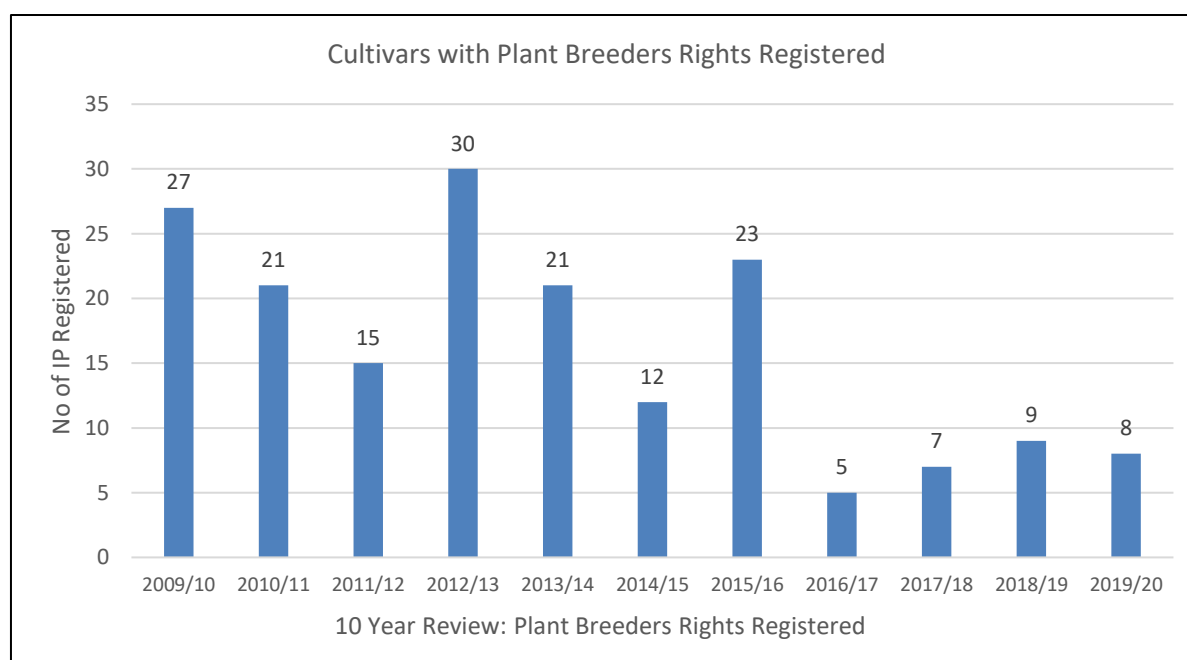
ANALYSIS OF ORGANISATIONAL PERFORMANCE TO INFORM THE FUTURE

Although operating with limited resources (scientific capacity, ageing equipment and infrastructure and finances), the ARC has succeeded in delivering on generating scientific output as measured by a significant increase in the number of peer reviewed scientific publications. For example, in the period between 2009/10 and 2019/20 (ten years) the number of peer reviewed scientific publications significantly increased from 197 to 499 (2017/18 FY). However, this performance decreased to 459 by 40 publications in financial year 2019/20.



ARC scientific publications (2009-2020)

Comparison of trends on peer-reviewed publications against number of Plant Breeders' Rights Registered over a similar period illustrates an alarming impact of limited resources, and in particular, reduction in funding for breeding programmes.



ARC cultivars with Plant Breeders Rights registered (2009-2020)

To address challenges of funding constraints for research programmes requires strategic partnerships. This is especially important in the context of changing climate, wherein the ARC endeavours to enable South Africa's agriculture to become resilient to adverse impacts of climate change such as drought. The ARC in partnership with other international public research organisations has developed drought tolerant maize varieties that are also resistant to infestation by the Fall Armyworm. Adoption and use of

these maize varieties have enabled the attainment of yields under drought conditions on smallholder farmers' fields. There are a number of research partnership funding models in the ARC, and many more in the process of being established to mobilise research funding for key programmes.

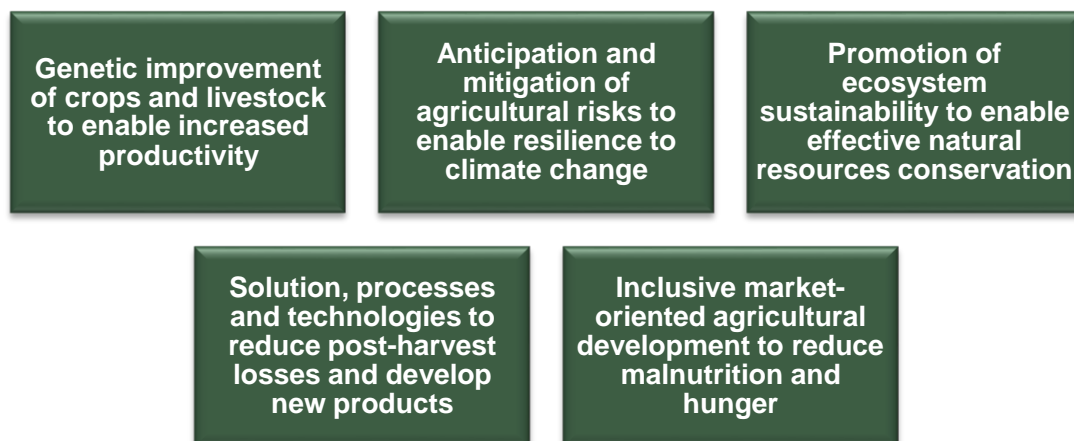
In many cases, outbreak of animal diseases has resulted in major losses to livestock production, with sometimes devastating consequences to the livelihoods and income for farmers; and in other instances, the spread of the disease has posed risks to public health. Research and innovations based on knowledge and understanding of immune responses and antibody development have enabled the ARC to develop diagnostic tools for various important animal disease that cause viruses, such as African horse sickness (AHS), bluetongue (BT), bovine tuberculosis, foot and mouth disease (FMD) and the horse parasite *babesia*. These diagnostic tools have been trademarked as the Nkuku® and Inshi® antibody libraries.

Some of the financial benefits to the ARC are that as a result of this research, diagnostics test for African horse sickness (AHS) and Bluetongue disease (BT) have been developed that can be used as in-house tests. Similar diagnostic kits, which are currently being used are imported at high costs. This is a potential saving to the Diagnostic unit at OVR. The Nkuku® and Inshi® antibody libraries are universal sources of reagents (recombinant antibodies) and we have had many requests for collaboration and/or as a service offered to clients to find useful reagents for use in diagnostics within the agricultural and medical fields. The reagents identified from these libraries can either be licenced to interested parties for production, or produced at ARC for sale. This is a potential source of income. We have cooperation agreements with the University of Pretoria and CSIR and a licensing agreement with University of Cape Town. The products identified, because of these collaborations, are not yet at commercial level. These technologies also provide a competitive edge to the organisation with the potential to develop into active research partnerships and collaborations ensuring increased research funding and improved corporate reputation.

Human resources capacity (skills and capable workforce) are critical for ARC success, to enable sustainable impact on the agricultural sector for a competitive economy. A skilled workforce and critical mass of scientists are essential for the ARC to fulfil its mandate. In order to mitigate the lack of critical mass of skilled scientists, veterinarians, engineers and technicians, the ARC has continued to invest substantially in education and training for both the development of employees and the sector. Capacity building interventions, such as the Professional Development Programme (PDP) and other employee training, have made a significant contribution to the skills development in the ARC. PDP enrolment increased from 50 postgraduate students in 2007/08 to 118 in 2019/20. Successful graduation for either MSc or PhD degrees has also seen a steady increase in the same period. Similarly, employees enrolled for postgraduate degrees have increased from 60 in 2007/08 to 318 in 2019/20.

As outlined in the external environmental analysis above, the agricultural landscape is likely to change significantly over the next few decades and the ARC needs to position itself appropriately to respond to the new requirements of the changing landscape. Mega trends experienced in the biophysical spaces will have significant impacts on agri-food research and the work of the ARC. Accordingly, the ARC has therefore developed its Vision 2050 to ensure that the organisation fulfils its obligations.

Research-focused areas serve as an organizational framework for achieving ARC's Vision 2050. It is of particular importance that Vision 2050 has been consulted and endorsed by a wide range of agricultural stakeholders, including DALRRD. The ARC 2050 research focus areas are as follows:



ARC Vision 2050 research focus areas

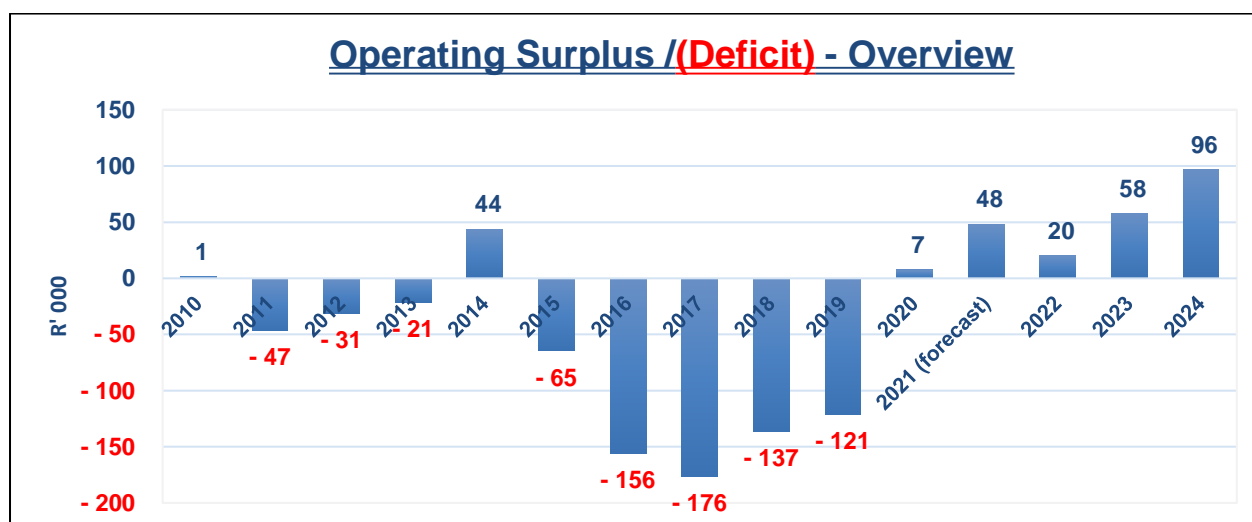
4.3. SUMMARY OF CRITICAL ISSUES INFORMING THE 2021/22 ANNUAL PERFORMANCE PLAN

The agricultural sector in South Africa is under threat from climate change events, including changing rainfall seasons and patterns, thus wreaking havoc with planting dates and crop management. As a result, yields are generally predicted to decrease under such extreme climate conditions. South Africa must ensure improved agricultural productivity and a reduction in post-harvest losses in order to maintain a sustainable agricultural sector. Furthermore, the country is expected to embrace new global trends in agricultural intensification, focusing more effectively on the use of water, land and energy in agriculture, in order to serve and contribute to South Africa's food demand and contribution to the economy. The current economic downturn and the increasing expectations for the ARC to demonstrate its relevance and the effectiveness of its programmes and services have exacerbated the challenges faced by the ARC in establishing and defining sustainability over the longer-term. There is also sentiments that the agricultural sector could be constrained going into 2021 due to policy uncertainties, adverse weather conditions and the ongoing COVID-19 pandemic. This is in addition to uncertainties of new outbreaks of pests and diseases, such as the Foot-and-mouth disease (FMD), which could potentially result in the ban on exports of livestock products from South Africa. The finalization and implementation of the Agriculture and Agro-processing Masterplan (AAMP) will go a long way in providing the much-needed policy direction and certainty.

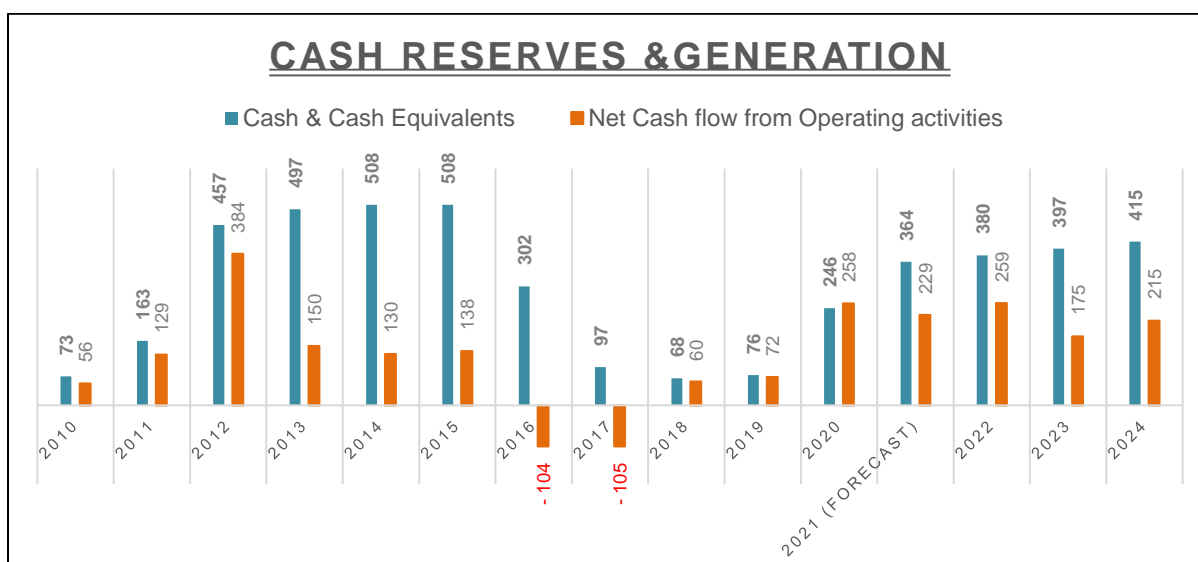
ARC SUSTAINABILITY AND TURNAROUND PLAN

The ARC has been operating with declining funding levels during FY2015/16 – FY2016/17 that affected the level of funding it receives from the Parliamentary Grant (PG), and its ability to generate external income has been negatively impacted. This has resulted in the following consequences for the organisation:

- a) The ARC consistently finds itself in a deficit, arising from the need to deliver world class research services in accordance with its mandate, whilst receiving inadequate funding in terms of adjusting to inflationary increases;



- b) The cash reserves have been on a consistent decline since its highest peak during the 2014/15 financial year and the ARC is facing a short-term liquidity crisis.



The current economic downturn and increasing expectations for the ARC to demonstrate its relevance and the effectiveness of its programmes and services, have exacerbated the challenges faced by the ARC to establish and define sustainability over the longer-term.

As a key provider of solutions for the management of pests and diseases, and the mitigation and adaption to climate change, a non-functional ARC would present a significant threat to food security, agriculture and economic growth, peace and sustainable development. Consequences of a dysfunctional or liquidated ARC would be too ghastly to contemplate for South Africa.

Accordingly, the ARC has identified key challenges that prevent the organisation from fulfilling its mandate. These challenges pose a greater risk to South Africa's food security, local demand for the delivery of safe and nutritional food and agricultural products, and therefore impose severe constraints on the ability of the organisation to achieve the objects of the ARC as outlined in the Agricultural Research Act²⁸.

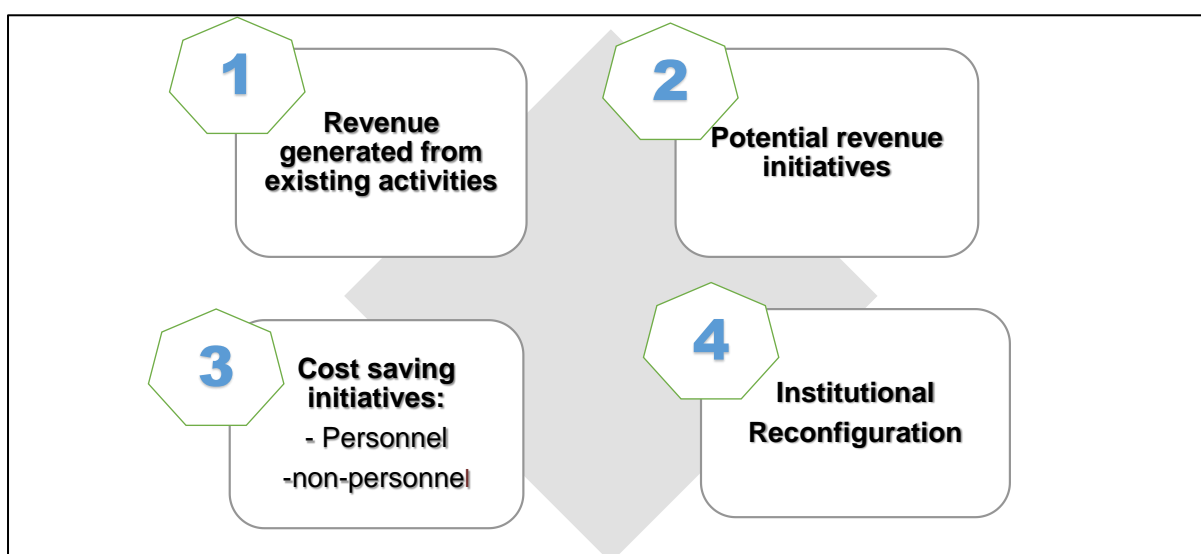
The factors outlined below, and the ARC's sustainability influence the prevailing funding challenges and the Sustainability and Financial Turnaround Plan seeks to provide the mitigations to ensure that the organisation is sustainable in the medium-term.

²⁸ Available: <https://www.arc.agric.za/Documents/Agricultural%20Research%20Act%20%2086%20of%201990.pdf>

| NO. | CHALLENGES | MITIGATION / INTERVENTIONS |
|-----|---|--|
| 1. | Reliance on declining Parliamentary Grant, which persisted until FY2020/21 | The ARC aims to reduce reliance on the Parliamentary Grant by increasing the contribution of External Income to Total Revenue |
| 2. | The lack of growth in external income over the same period has resulted in heavy reliance on the Parliamentary Grant, which is absorbed significantly by personnel costs. | There are initiatives to enhance revenue through: (a) Existing revenue sources and (b) potential new revenue sources / initiatives. The ARC is considering the reduction of the Personnel Costs as a % of Parliamentary Grant to 60% over the MTEF |
| 3. | Insufficient PG available to honour the co-funding arrangements. | The ARC has developed a Cost and Pricing framework, which has been approved by Council during FY2019/20. It is being implemented and is aimed at ensuring that the ARC accepts projects that are financially viable. |
| 4. | Lack of commercial acumen has exacerbated a culture of overreliance on grant funding. | A commercialisation strategy will be developed and approved by Council during the FY2021/22. A commercial entity will be established, which will be a commercial arm of the ARC The commercial farms within the ARC will be capitalised to ensure that they are financially sustainable during the MTEF. |
| 5. | Reliance on traditional external funders: The ARC has experienced a decline in funding from its traditional funders. This is partly due to the prevailing economic conditions that are affecting the traditional funders, but also from the lack of initiatives to explore new funding sources over an extended period. | Revenue from new sources, and new partners / funders to be explored. |
| 6. | ARC's existing partnerships (primarily with agriculture commodity organisations) and stakeholder perceptions have negatively impacted the financial wellbeing of the public entity, as some of these partnerships end up being subsidised by the ARC through its limited cash resources. The quality of these partnerships has not been a focal area of the ARC over the years. | Continuous stakeholder engagement to ensure the existing funders are retained with mutually beneficial terms and conditions. |
| 7. | Insufficient high-profile scientists with the ability to do the leading research work that attracts funding and external support. This, in turn, affects the ability to attract significant new and/or to roll over external funds. | The recruitment of high – profile scientists has been prioritised, and continuously monitored. |
| 8. | Lack of commercial acumen in our service areas: The ARC has a lot of potential revenue generating IP, and is well structured and positioned with infrastructure that it has built up over generations, to support its wide range of service offerings. However, currently the individual and multipurpose institutes which host the service laboratories are not self-funding and are primarily subsidised by the PG. | A commercialisation strategy will be developed and approved by Council during the FY2021/22. A commercial entity will be established, which will be a commercial arm of the ARC. The commercial farms within the ARC will be capitalised to ensure that they are financially sustainable during the MTEF. |

| NO. | CHALLENGES | MITIGATION / INTERVENTIONS |
|-----|--|---|
| 9. | The ARC has a primary focus on the delivery of research and development, and is geared towards these type of skill sets, with most scientists not stimulated or focused on the generation of capital or the commercial aspects of research delivery. As a result, the organisation lacks the capacity and tools necessary to immediately be commercialised, unless it undergoes significant re-engineering to adopt a commercial approach in providing its services. To illustrate this fact, the revenue received from royalties is low compared to the amount of registered IP within the ARC. | Acquire the business development and commercialization skills, to mitigate the prevailing skills gap within the ARC which result in untapped external income market. |
| 10. | The ARC is over capacitated with the skills set that do not match the demand, as thus requires organizational restructuring to achieve operational efficiencies. | The ARC as embarked on the Personnel savings initiatives, which will result in the restructuring; reduction of the staff complement (i.e. potential retrenchments); and appointment of critical skills required to achieve Vision 2050. |
| 11. | Assets base which are not aligned to the operational requirements and in recurring overheads amid the financial constraints | A review and revaluation of the properties and land within the ARC; and disposal of unutilized properties. |
| 12. | COVID-19 pandemic and related lockdown / restrictions has negatively impacted the ARC's ability to generate income whilst increasing the communications costs influenced by the Working from Home arrangements | The organization is exploring alternative means of delivering the services (i.e. virtually where possible and applicable) whilst costs are efficiently managed. |

Sustainable funding resource allocation is a critical element to enable the ARC to fulfil its mandate, which in turn contributes towards sustainable agriculture within South Africa and beyond the borders. Council approved the Sustainability and Financial Turnaround Plan during February 2019 as it is based on the following four (4) pillars:



THE FINANCIAL PLAN AND OVERVIEW ON THE KEY RATIOS

The historical trend on the funding gap, and forecasts over the MTEF period:

| AGRICULTURAL RESEARCH COUNCIL-TEN YEAR REVIEW | | | | | | | | | MTEF | | | | |
|--|-------|-------|-------|--------|--------|--------|--------|-------|---------------|-------|-------|-------|--|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 forecast | 2022 | 2023 | 2024 | |
| | R'm | R'm | R'm | R'm | R'm | R'm | R'm | R'm | R'm | R'm | R'm | R'm | |
| STATEMENT OF FINANCIAL PERFORMANCE | | | | | | | | | | | | | |
| Total Income | 1 104 | 1 363 | 1 358 | 1 249 | 1 203 | 1 308 | 1 314 | 1 357 | 1 322 | 1 485 | 1 552 | 1 622 | |
| Parliamentary Grant | 747 | 866 | 919 | 787 | 759 | 895 | 929 | 978 | 969 | 1 002 | 1 047 | 1 095 | |
| Baseline - Operational | 677 | 774 | 840 | 700 | 667 | 798 | 833 | 864 | 865 | 896 | 936 | 978 | |
| Baseline - Capital | 71 | 92 | 79 | 88 | 92 | 97 | 96 | 115 | 104 | 106 | 111 | 116 | |
| External Income | 318 | 466 | 407 | 435 | 427 | 386 | 354 | 332 | 284 | 361 | 378 | 395 | |
| Investment Income | 39 | 31 | 32 | 27 | 16 | 27 | 31 | 47 | 68 | 122 | 127 | 133 | |
| Other Income | - | - | - | - | - | - | - | - | - | - | - | - | |
| Total Expenditure | 1 015 | 1 227 | 1 344 | 1 317 | 1 287 | 1 346 | 1 339 | 1 235 | 1 170 | 1 359 | 1 384 | 1 409 | |
| Personnel Costs | 612 | 685 | 779 | 768 | 755 | 806 | 819 | 795 | 699 | 807 | 807 | 807 | |
| Operating Expenditure | 380 | 511 | 517 | 507 | 490 | 474 | 447 | 358 | 425 | 488 | 510 | 533 | |
| Depreciation | 24 | 31 | 47 | 42 | 42 | 45 | 73 | 82 | 46 | 64 | 66 | 69 | |
| Impairment of fixed property | 0 | - | 1 | - | - | 21 | - | - | - | - | - | - | |
| Net Surplus/(Deficit) | 89 | 136 | 14 | (68) | (84) | (38) | (25) | 122 | 153 | 127 | 169 | 213 | |
| Capital Expenditure | (110) | (92) | (79) | (88) | (92) | (97) | (96) | (115) | (104) | (106) | (111) | (116) | |
| Net Operational Surplus/(Deficit) | (21) | 44 | (65) | (156) | (176) | (137) | (121) | 7 | 48 | 20 | 58 | 96 | |
| STATEMENT OF FINANCIAL POSITION | | | | | | | | | | | | | |
| Property, plant and equipment | 784 | 880 | 944 | 1 006 | 1 037 | 1 080 | 1 401 | 1 759 | 1 916 | 2 005 | 2 087 | 2 187 | |
| Investments | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 3 | 5 | 5 | 5 | 5 | |
| Current assets (excluding cash) | 88 | 113 | 134 | 281 | 216 | 220 | 191 | 156 | 148 | 153 | 158 | 166 | |
| Cash resources (net of bank overdraft) | 497 | 508 | 508 | 302 | 97 | 68 | 76 | 246 | 443 | 516 | 396 | 208 | |
| Total Assets | 1 372 | 1 506 | 1 592 | 1 594 | 1 356 | 1 373 | 1 673 | 2 165 | 2 512 | 2 679 | 2 646 | 2 566 | |
| Capital and Reserves | 832 | 968 | 985 | 966 | 867 | 804 | 1 161 | 1 602 | 1 754 | 1 881 | 1 989 | 2 058 | |
| Non Current Liabilities | 193 | 209 | 213 | 155 | 148 | 142 | 140 | 249 | 384 | 448 | 330 | 152 | |
| Current Liabilities | 348 | 329 | 394 | 473 | 341 | 426 | 372 | 314 | 374 | 350 | 327 | 356 | |
| Total Equity and Liabilities | 1 372 | 1 506 | 1 592 | 1 594 | 1 356 | 1 373 | 1 673 | 2 165 | 2 512 | 2 679 | 2 646 | 2 566 | |
| CASH FLOWS | | | | | | | | | | | | | |
| Net cash flow from operating activities | 150 | 130 | 138 | (104) | (105) | 60 | 72 | 258 | 309 | 239 | 118 | 111 | |
| Net cash flow from investing activities | (110) | (147) | (110) | (102) | (100) | (89) | (64) | (89) | (112) | (166) | (239) | (298) | |
| Cash and cash equivalents at beginning of year | 457 | 497 | 480 | 508 | 302 | 97 | 68 | 76 | 246 | 443 | 516 | 396 | |
| Cash and cash equivalents at end of year | 497 | 480 | 508 | 302 | 97 | 68 | 76 | 246 | 443 | 516 | 396 | 208 | |
| RATIO ANALYSIS | | | | | | | | | | | | | |
| Profitability and asset management | | | | | | | | | | | | | |
| Asset Turnover | 1.0 | 1.1 | 1.1 | 1.1 | 1.2 | 1.4 | 1.0 | 0.7 | 0.6 | 0.6 | 0.6 | 0.7 | |
| Return on net assets (%) | 8.6% | 11.5% | 1.2% | (6.1%) | (8.3%) | (4.0%) | (1.9%) | 6.6% | 7.1% | 5.4% | 7.3% | 9.6% | |
| Current Ratio | 1.7 | 1.9 | 1.6 | 1.2 | 0.9 | 0.7 | 0.7 | 1.3 | 1.6 | 1.9 | 1.7 | 1.0 | |
| Operating margin (%) | 8.3% | 10.2% | 1.1% | (5.6%) | (7.1%) | (3.0%) | (2.0%) | 9.3% | 12.2% | 9.3% | 11.8% | 14.3% | |
| Performance | | | | | | | | | | | | | |
| Personnel Costs as a % of PG | 82% | 79% | 85% | 98% | 99% | 90% | 88% | 81% | 72% | 80% | 77% | 74% | |
| Personnel Costs as a % of PG (Exc Capex) | 90% | 89% | 93% | 110% | 113% | 101% | 98% | 92% | 81% | 90% | 86% | 82% | |
| Personnel Costs as a percentage of total expenditure % | 60% | 56% | 58% | 58% | 59% | 60% | 61% | 64% | 60% | 59% | 58% | 57% | |
| External revenue as a % of total income | 29% | 34% | 30% | 35% | 36% | 29% | 27% | 24% | 22% | 24% | 24% | 24% | |

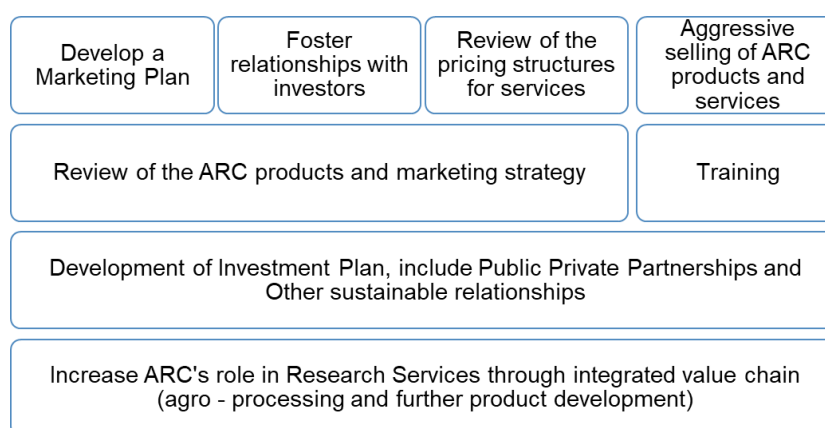
The current working capital gap and key ratios reflect an unsustainable financial position, which requires this targeted and robust Sustainability and Turnaround Plan to be implemented, to ensure that the Agricultural Research Council can plan for a surplus to comply with Section 53 of the Public Finance Management Act²⁹.

REVENUE AND COST OPTIMISATION INITIATIVES

The five-year Strategic Plan introduces various changes in the context of the “Sustainability and Turnaround Plan”, aimed at improving revenue generation from external income (sources other than the parliamentary grant, such as commodity organisations, farmers, private sector, etc.), by assessing both the feasibility of a number of revenue optimisation initiatives, as well as the optimisation of the cost structure including a reduction in personnel costs.

The following initiatives are included for consideration:

PILLAR 1: POTENTIAL GROWTH AREAS OF EXISTING REVENUE



Marketing Plan:

A marketing plan, which identifies ARC's clients, competitors and services offering, is currently under development and will be completed by March 31 2021. A separate Communications plan has been developed and approved by EMC.

Training:

Impact & Partnerships Division is involved in several training activities for external clients and pursuing more opportunities. The main current training activities include NARYEC training for DALRRD; Climate Smart Agriculture extension workers' training for GIZ (client). Currently in negotiation with DALRRD to increase the scope of the NARYEC training with potential additional income.

Aggressive selling of ARC products & services:

Setting up of online platforms to move ARC selling of products and services to e-commerce, as part of the marketing plan. The Commercialization Strategy being developed will also add impetus on these endeavours, including the establishment of the Commercialization Entity.

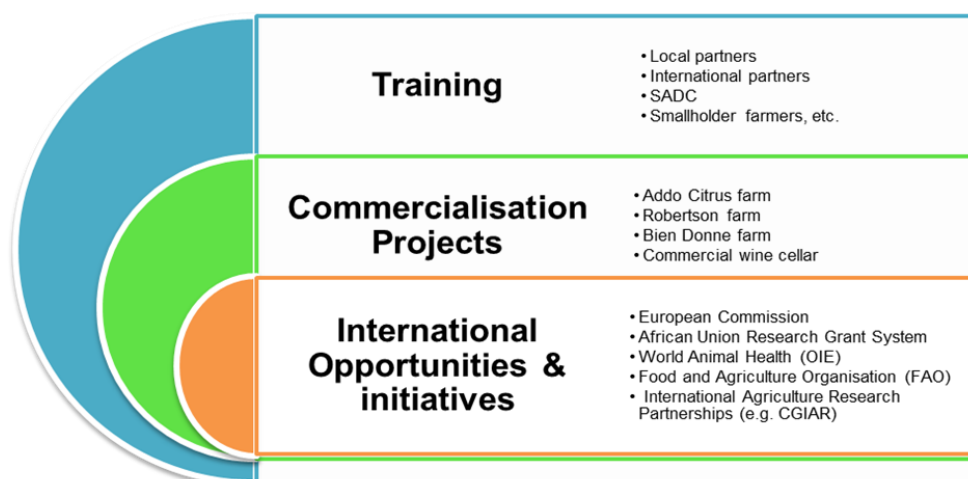
²⁹ Available: <http://www.treasury.gov.za/legislation/PFMA/act.pdf>

Review of the pricing structure for services:

This has already been done. However, this is an ongoing process in response to market needs and changing economic situation (i.e. cost of production to ensure full cost recovery with “profit”).

Foster relationships with investors:

Continuous engagement with potential investors for mutually beneficial collaborations and commercialization of ARC assets such as farms that are under-utilized, i.e. Addo and Bienne Donne farms. Furthermore, concerted efforts are being made to foster partnerships with the private sector by purveying ARC capabilities that could useful to the private sector and optimizing relationships with commodity groupings.

PILLAR 2: POTENTIAL NEW INITIATIVES FOR INCREASED EXTERNAL REVENUE WILL BE PURSUED TO ENSURE A SUSTAINABLE ARC:
**PILLAR 3: COSTS SAVING INITIATIVES**

Pillar 3 consist of two section:

- Pillar 3a: Human Capital Optimisation
- Pillar 3b: Non-personnel cost saving initiative

PILLAR 3a: HUMAN CAPITAL OPTIMISATION

Agricultural Research, by its nature, requires long-term funding to deliver outcomes that respond to specific national priorities and objectives. Accordingly, this requires that targeted programme/ project, personnel capital and funding arrangements are at the centre of the funding model. This reality is what defines the case for Government Funding for Research and Development as a strategic long-term investment in the future of the agricultural sector.

The ARC has resolved that the personnel cost base should be a percentage of the Parliamentary Grant, and has proposed a target of less or equal to 60%. This benchmark is the globally accepted norm that personnel costs should not be above the 60% mark, to allow sufficient resources for programme and project implementation, including basic organisational function costs (e.g. electricity, transport, water and other incidentals on a daily basis).

| CATEGORY | NO OF EMPLOYEES | SALARY COST PER ANNUM | LEAVE GRATUITY | SEVERANCE PAY | POST MEDICAL BENEFITS (FUNDED) | TOTAL |
|--|-----------------|-----------------------|----------------|---------------|--------------------------------|--------------------|
| Voluntary retrenchment packages based on the following averages; <ul style="list-style-type: none"> ▪ Number of employees: 1000 Salary: R300 000 per annum ▪ Years of service; 15 years ▪ Leave days: 20 days | 1 000 | 300 000 000 | 23 073 370 | 86 525 150 | 48 420 000 | 158 018 523 |
| 3 Separation Options: | | | | | | |
| Early Retirement (Age 55 and above) | 684 | 224 787 763 | 25 292 545 | - | 29 700 000 | 54 992 545 |
| LIFO (Last 5 years) | 568 | 151 068 375 | 6 429 603 | 6 487 359 | - | 12 916 961 |
| GG5 & below | 995 | 135 645 740 | 10 109 700 | 47 179 577 | 5 040 000 | 62 329 277 |

The ARC will need to reduce its Baseline Personnel Costs by R300 million in order to achieve the target of 60% personnel costs as a percentage of Operational PG. This will, however, require funding of R110 million, to pay for the leave gratuity and severance packages for the elimination of approximately 1000 non-core positions.

The following personnel related initiatives will be considered towards enabling ARC sustainable funding and financial sustainability:

- Review of the ARC performance incentive scheme for recognition and reward, inclusive of the retention plan;
- Reducing the cost of PDP from the PG while using the program for succession planning and skills development for the agriculture sector, mainly through leveraging resources from various contributing partners;
- Improving the skills base of ARC employees at levels below GG6 towards becoming multi-skilled, including use of new technologies and equipment both for support to research and for providing solutions in the sector;
- Savings in the reduction of personnel would need to be targeted towards increased investments into research and development, including seed funding for new projects, and
- Implementation in the reduction of personnel will be in accordance with applicable legislation and contractual requirements.

PILLAR 3b: COST SAVING INITIATIVES (EXCLUDING PERSONNEL)

Information Communication and Technology (ICT) projects by its nature are very high in monetary value but a necessity for the daily operations of the ARC. For the past few years, ICT projects and operations included services from Vodacom, renewal of computer equipment such as desktops, notebooks, and service contracts with third party vendors for system specific support such as Enterprise Resource Planning (ERP) and Laboratory Information Management systems (LIMS).

As part of the ARC's turnaround strategy, ICT started with the implementation of cost saving measures as far back as 2016. Although ARC has made significant strides on Microsoft services and licenses between 2017 and 2020, the ICT department is continuously embarking on cost-saving initiatives. These include amongst others, reviewing existing and optimizing software licensing models, reviewing ICT's service contract, monitoring and implementation cost control measures on telephone and data usage, and rationalizing the Multi-Functional Units (MFU) at the ARC campuses, to mention but a few. The estimated savings are R3 million per annum.

PILLAR 4: RECONFIGURATION OF THE ARC

Regulatory (governing legislation, including PFMA) and treasury requirements for compliance in respect of liquidity and financial sustainability constrain organisations such as the ARC. To ensure ARC regulatory compliance, it is essential for government (DALRRD and National Treasury) to provide immediate re-capitalisation and investment, which in turn, will enable the ARC to be appropriately reconfigured in alignment with changes in the agricultural sector for long-term sustainability.

As a matter of urgency, the ARC, through a process that would require substantial consultation with its many stakeholders and interested partners and parties, needs to undertake a thorough and comprehensive institutional and organisation review that would inform its **Institutional Reconfiguration and Fundamental Reforms**. These reforms would need to take into consideration the fact that the ARC has a backlog on infrastructure renewal and modernisation in excess of R1 billion. This infrastructure funding gap of R1 billion constrains the ARC from effectively and efficiently fulfilling its mandate of conducting research and development.

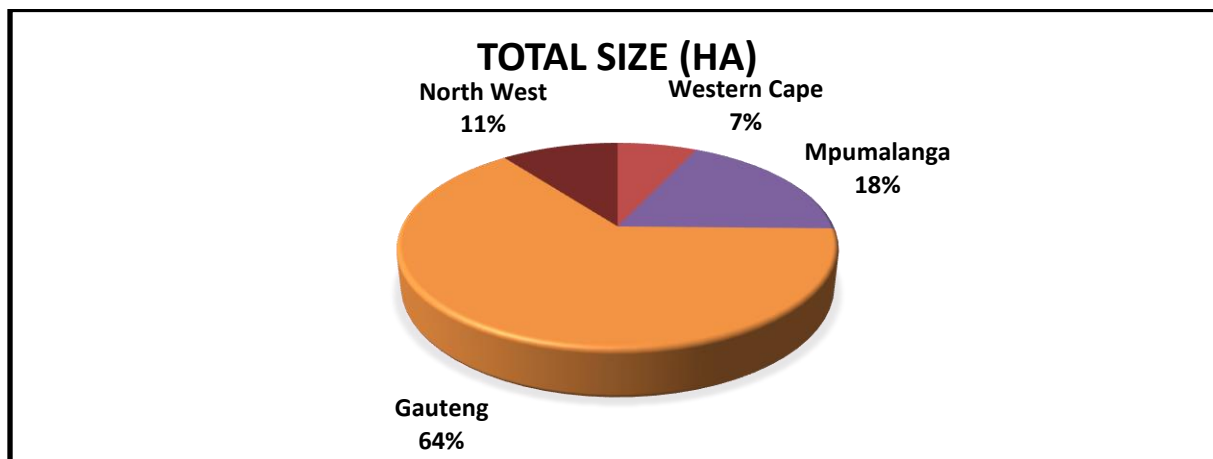
In terms of the PFMA³⁰, the ARC is a Schedule 3A public entity, which requires the organisation to depend on parliamentary grant allocations. Further, the ARC is not allowed to leverage its assets to borrow or obtain loans for its activities. Accordingly, there is no immediate alternative source of funding available to the ARC, including that of generating revenue through research and allied services from clients and other organisations. The long-term underfunding puts pressure on the ARC to realign and restructure, with consequences of reductions in personnel complement. The impact would be reduced services to the agricultural sector, which in turn, could result in reduced productivity with the possible eventual impact on food insecurity.

For the ARC to move forward on executing on the personnel savings requires, either further funding from government as a shareholder through the Minister responsible for Agriculture, Land Reform and Rural Development as well as the National Treasury, or bridging finance, as the current liquidity position of the ARC does not make it feasible to undertake the necessary restructuring in light of the fact that the ARC is in a negative cash position of the operating portion (excluding FMD cash) of the PG. It is imperative that a more detailed proposal is developed and canvassed with government as the shareholder, mainly the Minister: Agriculture, Land Reform and Rural Development, and the National Treasury.

³⁰ Available: <http://www.treasury.gov.za/legislation/PFMA/act.pdf>

To ensure a sustainable organisation that contributes effectively towards the ARC Vision 2050, there will be a need to explore the size and shape of ARC's footprint. This may require the relocation of some research facilities into areas most in need by the agricultural sector. Accordingly, the ARC will need to develop a migration plan to support this 2021/22 APP, the Strategic Plan and Vision 2050³¹.

The ARC has conducted an analysis in respect of effective and sustainable funding for the maintenance of infrastructure. This Baseline Funding Study indicates that the level of maintenance on ARC facilities has been high due to ageing infrastructure. The ARC currently has 17, 720 hectares within its portfolio (consisting of over 42 properties), and the composition per province is outlined below:



Subsequently, the ARC has developed an Asset Management Plan for the effective utilisation of fixed properties. In this Asset Management Plan, the following objectives are identified:

- 1) ARC to ensure that it retains and improves the condition of all fixed properties (immovable assets) that contribute to the core mandate of the organisation – research and development;
- 2) Appropriate investments will need to be explored for improvements in ARC's immovable assets so that they can be effectively and efficiently utilised for research and development;
- 3) Amalgamation of all ARC campuses for the organisation to conduct research and development on not more than 3 sites, subject to regulatory, biosecurity and other risk considerations;
- 4) In accordance with the Asset Management Plan, those assets not essential to the core business of the ARC could be considered for various uses such as:
 - a) Addressing agricultural development requirements, such as supporting agri-businesses, smallholder farmer development, training, etc.;
 - b) Use for commercialisation of ARC technologies;
 - c) Rental as an income stream;
 - d) Disposal of non-revenue generating fixed assets, particularly land and buildings; and/or
 - e) Use for revenue enhancement towards ARC operations.

³¹ Available: <http://www.arc.agric.za/Documents/BannerPdfs/Archive/LaunchARCVision2050.pdf>

- 5) A procurement process has been initiated for the valuation of the ARC buildings, land earmarked for disposal and determination of the market related rentals for the properties that are currently being leased. A feasibility study will be conducted for the consolidation of the Pretoria campuses, which will be ultimately be reduced from eight campuses to three campuses (i.e. the campuses that are remaining are Onderstepoort; Irene and Roodeplaat). A valuation will be done to ascertain a true market value for the campuses identified for disposal. The following properties have been earmarked for disposal: (a) Umthiza farm; (b) Rustenburg IC Campus; (c) SCW campus; (d) AE campus; (e) Addo farm; (f) Musina farm; (g) Staff compound (Bethlehem); (h) R80 land; (i) R566 land; (j) SAPS Rondavel (Pretoria North); (k) N4 & R566 land (behind UP Vet campuses), and (l) Queenstown Bull testing.

| BOOK VALUES AT JANUARY 2021 (R'000) | | | | |
|-------------------------------------|----------------|----------------|----------------|----------------|
| Campus Name | Land | Buildings | Infrastructure | Total |
| Agriculture Engineering | 2 350 | 3 415 | 5 234 | 10 999 |
| Animal Production | 122 260 | 50 175 | 20 410 | 192 845 |
| Biotechnology Platform | 0 | 2 430 | 165 | 2 595 |
| Central Office | 30 200 | 20 594 | 7 520 | 58 314 |
| Onderstepoort Veterinary | 71 470 | 41 705 | 31 217 | 144 392 |
| Plant Health | 20 500 | 64 257 | 9 671 | 94 428 |
| Vegetable Ornamentals | 25 000 | 39 458 | 11 096 | 75 554 |
| Soil Climate Water | 3 950 | 7 317 | 2 636 | 13 903 |
| TOTAL | 275 730 | 229 351 | 87 949 | 593 030 |

- 6) There will be rationalisation of the movable assets, and excess assets to be disposed of, which includes the following asset types: computer equipment; computer systems; laboratory equipment; vehicles; machinery & farming equipment, and office furniture.

CRITICAL SUCCESS FACTORS

In order to achieve financial sustainability while aiming for the realisation of Vision 2050, the following critical success factors have been identified within the ARC:

- 1) Effective support (financial, regulatory approvals and others) by the Minister responsible for ARC, in concurrence with Minister of Finance;
- 2) Good governance – Council and management working seamlessly to ensure success of the proposed sustainable funding;
- 3) Organisational structure to support the implementation of the ARC's five-year Strategic Plan;
- 4) Broad communication and effective engagements with all employees, including through organised labour and related change management processes;
- 5) Ensuring implementation has minimal adverse impact on ARC's research and development and technology transfer initiatives, and
- 6) Successfully implemented /Organisational culture change and change management

NEXT STEPS

| PILLAR | NO. | INITIATIVE | APPROVAL BY | YEAR |
|--------|-------|---|--|-----------------|
| 1. | 1.1 | ARC Marketing Strategy and Plan | Council | FY2021/22 |
| | 1.2 | Stakeholder Engagement Plan – Investors / Funders (Current & Potential) | Executive Management | FY2021/22 |
| | 1.3 | Implement the ARC Pricing and Costing Framework | Already approved by Council | FY2020/21 |
| | 1.4 | IP Commercialisation strategy and Plan | Council | FY2021/22 |
| | 1.5 | Review and re-negotiate (where practical) the IP agreements, to align to market value/(s) | Executive Management | FY2021/22 |
| 2. | 2.1 | Develop an Incentive Bonus Scheme – linked to fundraising activities | Council | FY2021/22 |
| | 2.2 | Recruit and attract high-level scientists | Executive Management | FY2021/22 |
| | 2.3 | Review and renegotiate lease contracts to align to market value - External / private tenant - ARC employees | Executive Management | FY2021/22 |
| | 2.4 | ARC to Develop new commercial products and services | Executive Management | FY2022 – FY2024 |
| | 2.5 | Reprioritise Capex PG to fund the commercialisation of ARC Technologies & technologies modernisation / renewal | Executive Management | FY2021 & FY2022 |
| 3a | 3.1 | Human Capital Optimisation | Council | FY2022 – FY2024 |
| 4 | 4.1 | Consolidation of the Campuses | | |
| | 4.1.1 | IIC and VOPI – approval & implementation | Council | FY2021/22 |
| | 4.1.2 | SCW and AE – approval and Implementation | Council | FY2021/22 |
| | 4.2 | Consolidation of Pretoria Offices | | |
| | 4.2.1 | Feasibility Study and approval of the applicable plans | Council | FY2020/21 |
| | 4.2.2 | Review & Valuation of properties identified for disposal/alienation | Council | FY2021/22 |
| | 4.2.3 | Disposal of non-core assets | Executive Authority & National Treasury | |
| | 4.3 | Amalgamation of all ARC Campuses - Feasibility study - Implementation | Council Executive Authority & National Treasury | FY2022 – FY2024 |

PART C: MEASURING OUR PERFORMANCE

The Agricultural Research Council Impact and Outcomes reflected in the 2020-25 Strategic Plan are unpacked in the 2021/22 Annual Performance Plan, as reflected in the sections below.

5. INSTITUTIONAL PERFORMANCE INFORMATION

As the ARC does not have Treasury approved budget programmes, the ARC Results Based Plan and performance information is packaged against the six (6) outcomes defined in the 2020-2025 Strategic Plan, and reflecting the contributing Business Divisions, as follows:

| ARC OUTCOME | CONTRIBUTING BUSINESS DIVISIONS |
|---|--|
| 1. Increased agricultural production and productivity | 1) Crop Sciences 2) Animal Sciences |
| 2. Sustainable ecosystems and natural resources | 1) Crop Sciences 2) Research and Innovation Systems |
| 3. Improved nutritional value, quality and safety of agricultural products | 1) Crop Sciences |
| 4. A skilled and capable agriculture sector | 1) Crop Sciences 2) Animal Sciences 3) Research and Innovation Systems 4) Impact and Partnerships |
| 5. Enhanced resilience of agriculture | 1) Crop Sciences 2) Animal Sciences 3) Research and Innovation Systems |
| 6. A high-performing and sustainable organisation | 1) Office of the CEO 2) Human Resources and Legal Services 3) Impact and Partnerships 4) Finance 5) ICT and Infrastructure 6) All other Divisions |

For each outcome, the focus and priorities, the contribution of the relevant business divisions and the outputs, output indicators and annual and quarterly targets, are presented in the following sections.

5.1. ARC OUTCOME 1: INCREASED AGRICULTURAL PRODUCTION AND PRODUCTIVITY

ARC OUTCOME 1: FOCUS AND PRIORITIES AND CONTRIBUTING DIVISIONS

The focus of Outcome 1 is to generate knowledge and technologies (intellectual property and tools) that will diversify, improve the quality and increase the value of crop and animal based agricultural production and related processes and products; enhance productivity towards increased food security, commercial exports and income for the agricultural sector, and enabling farmers and producers to maximise their efficiency and productivity.

The Outcome focuses on improving the productivity, competitiveness and sustainability of both commercial and smallholder agriculture through research and development in:

- 1) Crop research and development: including a wide range of grains, vegetables, indigenous ornamental plants, medicinal plants, deciduous fruit and grapes, tropical and subtropical fruits and niche crops, such as herbal teas. Industrial crops research and development will focus on fibre crops, such as cotton and hemp.
- 2) Livestock-based agriculture: through research and technology in areas related to animal health, production and improvement, as well as secondary production processes. The research and development is focused on both production and companion animals, and increasingly in the areas of aquaculture and wildlife.

Outcome 1 is aligned to the 2019-2024 Medium Term Strategic Framework (MTSF) and the strategic priorities and outcomes of the DALRRD and DSI as follows:

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|--|--|---|---|
| Priority 2: Economic transformation and job creation: <u>2024 Impact:</u> <ul style="list-style-type: none"> ▪ Unemployment reduced to 20%-24% ▪ 2 million new jobs especially for youth ▪ Economic growth of 2%-3% ▪ Growth in levels of investment to 23% of GDP | Outcome 1: More decent jobs created and sustained, with youth, women and persons with disabilities prioritised: <ul style="list-style-type: none"> – Create jobs through Job Summit Commitments, Operation Phakisa and other public sector employment programmes Outcome 3: Industrialisation, localisation and exports: <ul style="list-style-type: none"> – Support localisation and industrialisation through government procurement Outcome 5: Reduce concentration and monopolies and expanded small business sector: <ul style="list-style-type: none"> – Facilitate the increase in number of functional small businesses with a focus on | Outcome 3: Redress and equitable access to land and producer support: <ul style="list-style-type: none"> – Number of smallholder producers commercialised – Skilled and employable youth in the agriculture sector Outcome 4: Increased production in the agricultural sector: <ul style="list-style-type: none"> – 10% increase in agricultural production by 2025 Outcome 5: Increased market access and maintenance of existing markets: | Industrialisation, localisation and exports: <ul style="list-style-type: none"> – Masterplans developed for all national priority sectors by end 2021 – DSI supporting Improve competitiveness through ICT adoption: <ul style="list-style-type: none"> – GERD of 1.1% as a percentage of GDP by 2024 – Commercialisation of intellectual property |

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|---|--|--|--|
| | township economies and rural development | <ul style="list-style-type: none"> – % increase of domestic use (value added) of agricultural products | |
| Priority 5: Spatial integration, human settlement and local government: <u>2024 Impact:</u> <ul style="list-style-type: none"> ▪ Rapid land and agrarian reform contributing to reduced asset inequality, equitable distribution of land and food security | Outcome 7: Sustainable land reform: <ul style="list-style-type: none"> – Land reform projects provided with post-settlement support. Outcome 8: Agrarian Transformation: <ul style="list-style-type: none"> – Smallholder farmers supported for food production and commercial activities – Smallholder farmers supported with skills and infrastructure and financial support measures to increase productivity – Agri-hubs and agro-processing facilities established Outcome 9: Effective regulatory framework of agricultural produce and exports: <ul style="list-style-type: none"> – Review the standards on SAGAP and Global GAP to enable smallholder farmers' participation in the domestic and global GAP – Governance and operational review of the National Fresh Produce Markets, and Agency role in market access for smallholder farmers' participation | Outcome 6: Integrated and inclusive rural economy: <ul style="list-style-type: none"> – Provide support to rural enterprises and industries in areas with economic opportunities – Increase job opportunities and ensure skills development – Facilitate infrastructure development to support rural economic transformation | Inclusive rural economy: <ul style="list-style-type: none"> – Provision of applications and products for precision agriculture, human settlement and water bodies information layers – Demonstrations in partnership with the Department of Mineral Resources and Energy to assess the appropriateness of new technologies such hydrogen fuel cells to improve service delivery |
| Priority 7: A better Africa and the world: <u>2024 Impact:</u> <ul style="list-style-type: none"> ▪ A better South Africa | Outcome 1: Increased Foreign Direct Investment (FDI) into South Africa: <ul style="list-style-type: none"> – Source investment for the identified sectors in the South African economy Outcome 2: Increased and diversified exports resulted/ contributed to an export orientated economy: <ul style="list-style-type: none"> – Facilitate exports through the Export Marketing and | Outcome 5: Increased market access and maintenance of existing markets: <ul style="list-style-type: none"> – % increase of agricultural exports | Improve competitiveness through ICT adoption: <ul style="list-style-type: none"> – Commercialisation of intellectual property Agenda 2063 aligned programmes Compliance with international protocols and commitments |

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|-----------------------------------|---|--------------------------------|-----------------------------|
| | Investment Assistance Scheme (EMIA) fund Outcome 4: Increased regional integration and trade: <ul style="list-style-type: none"> – Implementation of the detailed implementation plans for prioritised project of the Indicative Strategic Implementation Plan – Implementation of the African Continental Free Trade Agreement (AfCFTA) and other trade agreements in order to grow intra-Africa Trade | | |

Outcome 1 is the focus of the following ARC Divisions:

- 1) Crop Sciences, and
- 2) Animal Sciences.

ARC OUTCOME 1: OUTPUTS, OUTPUT INDICATORS AND TARGETS

In contributing towards the ARC's desired impact of “**sustainable agricultural systems for agrarian transformation, food and nutrition security**”, the 2021/22 Performance Plan for Outcome 1 is reflected in the log frame tables below:

ARC OUTCOME 1: Outputs, Output Indicators and Annual Targets

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|--|-------------------------------|--|---|----------------------------|---------|---------|-----------------------|---------------------|---------|---------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 1. Increased agricultural production and productivity | Crop Sciences | Crop production technologies developed and information dissemination | Number of cultivars registered | 2 | 7 | 8 | 11 | 6 | 11 | 10 |
| | | | Number of field trials | 195 | 235 | 541 | 215 | 271 | 249 | 235 |
| | | | Number of technical reports | 240 | 362 | 442 | 258 | 170 | 164 | 189 |
| | | | Number of cultivar evaluations | 0 | 0 | 0 | 60 | 40 | 40 | 40 |
| | Animal Sciences | Animal improvement services | Number of farmers participating in each of the animal improvement schemes | 620 | 465 | 247 | 200 | 210 | 220 | 230 |
| | | | Number of technical reports | 0 | 0 | 0 | 1 000 | 900 | 1000 | 1100 |

ARC OUTCOME 1: Output Indicators, Annual and Quarterly Targets

| RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | 2021/22 ANNUAL TARGET | QUARTERLY TARGETS | | | |
|-------------------------------|---|---|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | Q1 Apr - Jun 2021 | Q2 Jul - Sep 2021 | Q3 Oct - Dec 2021 | Q4 Jan - Mar 2022 |
| Crop Sciences | Crop technologies developed and information dissemination | Number of cultivars registered | 6 | 0 | 0 | 2 | 4 |
| | | Number of field trials | 271 | 182 | 37 | 24 | 28 |
| | | Number of technical reports | 170 | 18 | 82 | 33 | 37 |
| | | Number of cultivar evaluations | 40 | 0 | 0 | 4 | 36 |
| Animal Sciences | Animal improvement services | Number of farmers participating in each of the animal improvement schemes | 210 | 100 | 50 | 30 | 30 |
| | | Number of technical reports | 900 | 200 | 300 | 200 | 200 |

ARC OUTCOME 1: EXPLANATION OF PLANNED PERFORMANCE OVER THE MEDIUM-TERM PERIOD

The Outcome is aligned to ARC Vision 2050 through a focus on the research, development and dissemination of solutions, processes and technologies for the ongoing genetic improvement of crops and livestock; enhancing the agriculture value chain and supporting inclusive market-orientated development for smallholder farmers, agri-businesses and enterprises in the agriculture value chain.

For the 5-year period to 2025, the research and development priorities of Outcome 1 are:

- 1) Crop cultivar development through genetic improvement and modification
- 2) Securing and maintaining the health of animals through the application of cutting edge technologies
- 3) Promoting the adoption of animal recording and improvement schemes by livestock farmers, as a platform for economic and community development in the smallholder sector
- 4) Characterising and evaluating crops in terms of quality, nutritional composition, shelf life and suitability for processing
- 5) Disease and pest control by means of enhanced genetic diversity
- 6) Provision of strategies for management of pests, diseases and alien invaders
- 7) The improvement of agricultural productivity and profitability through adaptive and innovative management and production systems, such as conservation agriculture
- 8) Developing production practices and systems, including rotation, intercropping, irrigation, fertigation, weed management, plant densities and general practices
- 9) Breeding and improving forage varieties, including grasses and legumes
- 10) Lowering of input costs
- 11) Developing efficient and cost effective feeding strategies for ruminant and non-ruminant animals
- 12) Production systems for low input, low decision-making and marginal production areas
- 13) Training of crop growers and extension staff to ensure sustainable production
- 14) Providing the South African livestock industry with appropriate and internationally recognised recording and improvement services

Key enablers to support delivery of the Outcome include:

- 1) Financial resources;
- 2) Human resources;
- 3) Equipment;
- 4) Internal policies and operating procedures;
- 5) Land and buildings;
- 6) Enabling policies and regulations from government;
- 7) Enabling support and facilitation by the shareholder;
- 8) Stakeholder mobilisation and partnerships, and
- 9) Industry buy-in (farmers).

ARC OUTCOME 1: RESOURCE CONSIDERATIONS

Financial Resources

| DIVISION | AMOUNT IN R '000 |
|------------------------|------------------|
| Crop Sciences | 86 007 |
| Animal Sciences | 1 773 |
| Total expenses: | 87 779 |

Human Resources

| DIVISION | RESEARCHERS | RESEARCH SUPPORT | OTHER SUPPORT |
|-----------------|-------------|------------------|---------------|
| Crop Sciences | 165 | 181 | 232 |
| Animal Sciences | 53 | 150 | 39 |

5.2. ARC OUTCOME 2: SUSTAINABLE ECOSYSTEMS AND NATURAL RESOURCES

ARC OUTCOME 2: FOCUS AND PRIORITIES AND CONTRIBUTING DIVISIONS

The focus of Outcome 2 is to generate knowledge and technologies (intellectual property and tools) that will conserve natural resources and sustain agriculture.

The Outcome focuses on improving the productivity, competitiveness and sustainability of both commercial and smallholder based agriculture through research and technology in areas related to efficient energy utilisation, water management and irrigation practices; the rehabilitation, utilisation, development and protection of natural agricultural resources; new and improved conservation and climate smart agriculture systems; improved monitoring and characterisation systems for natural

resources and genetic material; and mechanised farming and irrigation practices, techniques, equipment and machinery.

Outcome 2 is aligned to the 2019-2024 Medium Term Strategic Framework (MTSF) and the strategic priorities and outcomes of the DALRRD and DSI as follows:

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|--|--|--|---|
| Priority 5: Spatial integration, human settlement and local government: <u>2024 Impact:</u> <ul style="list-style-type: none"> ▪ Institutionalise spatial / territorial integration to fast track transformation and resilience of sub-national regions ▪ Natural Resources are managed and sectors and municipalities are able to respond to the impact of climate change | Outcome 4: Greenhouse Gas Emission Reduction (Mitigation): <ul style="list-style-type: none"> – Implement 4 sectors Green House Gas emission reduction implementation plan (contribution from the largest emitters of GHG) – Transition plans for high carbon emitting sectors (energy, transport, agriculture and waste to low carbon economy) developed by 2024 Outcome 6: State of ecological infrastructure improved: <ul style="list-style-type: none"> – Rapidly and intensively rehabilitate and restore land – Water resource classes and Resource Quality Objectives (RQOs) by 2024 Outcome 8: Agrarian Transformation: <ul style="list-style-type: none"> – Degraded land rehabilitated to production Outcome 11: Effective water management system for the benefit of all: <ul style="list-style-type: none"> – Feasibility studies for rehabilitation vs new dams – Review current Water Legislations | Outcome 6: Integrated and inclusive rural economy: <ul style="list-style-type: none"> – Provide support to rural enterprises and industries in areas with economic opportunities – Increase job opportunities and ensure skills development – Facilitate infrastructure development to support rural economic transformation | Inclusive rural economy: <ul style="list-style-type: none"> – Provision of applications and products for precision agriculture, human settlement and water bodies information layers – Demonstrations in partnership with the Department of Mineral Resources and Energy to assess the appropriateness of new technologies such hydrogen fuel cells to improve service delivery Reduced Vulnerability of Key Sectors to Climate Change: <ul style="list-style-type: none"> – Provide information for air quality information system, land cover and land use mapping, frequent information on weather patterns, and human activity on critical resources such as water, land and air – Provision of decision support tools, human settlements layer, water bodies information layer |

Outcome 2 is the focus of the following ARC Divisions:

- 1) Crop Sciences, and
- 2) Research and Innovation Systems.

ARC OUTCOME 2: OUTPUTS, OUTPUT INDICATORS AND TARGETS

In contributing towards the ARC's desired impact of **“sustainable agricultural systems for agrarian transformation, food and nutrition security”**, the 2021/22 Performance Plan for Outcome 2 is reflected in the log frame tables below:

ARC OUTCOME 2: Outputs, Output Indicators and Annual Targets

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|---|-------------------------------|-----------------------------|--|----------------------------|---------|---------|-----------------------|---------------------|---------|---------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 2. Sustainable ecosystems and natural resources | Crop Sciences RIS | Natural Resource Management | Number of technical reports | 83 | 71 | 73 | 89 | 77 | 78 | 78 |
| | | | Number of field trials | 45 | 61 | 52 | 59 | 64 | 68 | 64 |
| | | | Number of services rendered | 202 | 166 | 105 | 197 | 500 | 582 | 595 |
| | | | Number of biological control solutions developed | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| | | Soil and Water Science | Number of samples analysed for soil health and water quality | 346 | 416 | 481 | 628 | 95 | 155 | 160 |
| | | | Number of scientific solutions | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | | Number of technical reports | 8 | 28 | 17 | 29 | 13 | 17 | 21 |
| | | | Number of services rendered | 0 | 0 | 0 | 356 | 305 | 405 | 455 |
| | | Weed Science | Number of technical reports | 0 | 0 | 0 | 12 | 12 | 12 | 12 |
| | | | Number of services rendered | 74 | 12 | 10 | 10 | 5 | 0 | 0 |
| | | Ecosystem services | Number of technical reports | 0 | 1 | 1 | 1 | 1 | 2 | 3 |
| | | | Number of services rendered | 0 | 0 | 0 | 2 | 2 | 2 | 2 |

ARC OUTCOME 2: Output Indicators, Annual and Quarterly Targets

| RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | 2021/22 ANNUAL TARGET | QUARTERLY TARGETS | | | |
|-------------------------------|-----------------------------|--|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | Q1 Apr - Jun 2021 | Q2 Jul - Sep 2021 | Q3 Oct - Dec 2021 | Q4 Jan - Mar 2022 |
| Crop Sciences RIS | Natural Resource Management | Number of technical reports | 77 | 13 | 26 | 17 | 21 |
| | | Number of field trials | 64 | 37 | 3 | 7 | 17 |
| | | Number of services rendered | 500 | 120 | 120 | 140 | 120 |
| | | Number of biological control solutions developed | 1 | 0 | 0 | 0 | 1 |
| | Soil and Water Science | Number of samples analysed for soil health and water quality | 95 | 22 | 24 | 16 | 33 |
| | | Number of scientific solutions | 1 | 0 | 0 | 0 | 1 |
| | | Number of technical reports | 13 | 0 | 1 | 1 | 11 |
| | | Number of services rendered | 305 | 60 | 65 | 90 | 90 |
| | Weed Science | Number of technical reports | 12 | 0 | 6 | 0 | 6 |
| | | Number of services rendered | 5 | 0 | 2 | 3 | 0 |
| | Ecosystem services | Number of technical reports | 1 | 0 | 0 | 0 | 1 |
| | | Number of services rendered | 2 | 0 | 1 | 0 | 1 |

ARC OUTCOME 2: EXPLANATION OF PLANNED PERFORMANCE OVER THE MEDIUM-TERM PERIOD

The Outcome is aligned to ARC Vision 2050 through a focus on the research, development and dissemination of solutions, processes and technologies for the promotion of ecosystem sustainability.

For the 5-year period to 2025, the research and development priorities of Outcome 2 are:

- 1) Well-functioning natural assets and natural resources databases
- 2) Efficient utilisation of natural resources for improved agricultural productivity
- 3) Maintenance and management of genetic material databases and national collections
- 4) Developing techniques for appropriate value adding farm structures and infrastructure and related livestock facilities
- 5) Crop water productivity and efficiency at various planning and operational levels
- 6) Management of agricultural water and integrated management of catchments
- 7) Bio-fuel research and especially assessment of critical success factors
- 8) Mapping of existing and potential production areas
- 9) Developing equipment for conservation agriculture (CA)
- 10) Developing precision systems to minimise wastage when planting, fertiliser application, and spraying, harvesting and enhanced animal production systems

Key enablers to support delivery of the Outcome include:

- 1) Financial resources;
- 2) Human resources;
- 3) Equipment;
- 4) Internal policies and operating procedures;
- 5) Land and buildings;
- 6) Enabling policies and regulations from government;
- 7) Enabling support and facilitation by the shareholder;
- 8) Stakeholder mobilisation and partnerships, and
- 9) Industry buy-in (farmers).

ARC OUTCOME 2: RESOURCE CONSIDERATIONS

Financial Resources

| DIVISION | AMOUNT IN R '000 |
|------------------------|------------------|
| Crop Sciences | 194 226 |
| RIS | 39 454 |
| Total expenses: | 267 225 |

Human Resources

| DIVISION | RESEARCHERS | RESEARCH SUPPORT | OTHER SUPPORT |
|---------------|-------------|------------------|---------------|
| Crop Sciences | 123 | 85 | 253 |
| RIS | 100 | 27 | 45 |

5.3. ARC OUTCOME 3: IMPROVED NUTRITIONAL VALUE, QUALITY AND SAFETY OF AGRICULTURAL PRODUCTS

ARC OUTCOME 3: FOCUS AND PRIORITIES AND CONTRIBUTING DIVISIONS

The focus of Outcome 3 is to generate knowledge, solutions and technologies for food safety, quality and improved efficiencies in the agriculture value chain, with particular focus on agro-processing, pre- and post-harvest processing biotechnology and informatics, each cross-cutting across different areas of the agricultural value chain and intended to be applied to the full value chain of crops, animals and agricultural system research.

Outcome 3 is aligned to the 2019-2024 Medium Term Strategic Framework (MTSF) and the strategic priorities and outcomes of the DALRRD and DSI as follows:

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|---|---|--|--|
| Priority 5: Spatial integration, human settlement and local government: <u>2024 Impact:</u> ▪ Rapid land and agrarian reform contributing to | Outcome 8: Agrarian Transformation: <ul style="list-style-type: none"> Degraded land rehabilitated to production Smallholder farmers supported for food production and commercial activities Smallholder farmers supported with skills and infrastructure and financial | Outcome 5: Increased market access and maintenance of existing markets: <ul style="list-style-type: none"> % increase of domestic use (value added) of agricultural products Outcome 6: Integrated and inclusive rural economy: | Inclusive rural economy: <ul style="list-style-type: none"> Provision of applications and products for precision agriculture, human settlement and water bodies information layers Demonstrations in partnership with the Department of Mineral Resources |

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|--|--|--|---|
| reduced asset inequality, equitable distribution of land and food security | support measures to increase productivity <ul style="list-style-type: none"> – Agri-hubs and agro-processing facilities established Outcome 9: Effective regulatory framework of agricultural produce and exports: <ul style="list-style-type: none"> – Review the standards on SAGAP and Global GAP to enable small holder farmers' participation in the domestic and global GAP – Governance and operational review of the National Fresh Produce Markets, and Agency role in market access for smallholder farmers' participation | <ul style="list-style-type: none"> – Provide support to rural enterprises and industries in areas with economic opportunities – Increase job opportunities and ensure skills development – Facilitate infrastructure development to support rural economic transformation | and Energy to assess the appropriateness of new technologies such hydrogen fuel cells to improve service delivery |

Outcome 3 is the focus of the following ARC Divisions:

- 1) Crop Sciences.

ARC OUTCOME 3: OUTPUTS, OUTPUT INDICATORS AND TARGETS

In contributing towards the ARC's desired impact of “**sustainable agricultural systems for agrarian transformation, food and nutrition security**”, the 2021/22 Performance Plan for Outcome 3 is reflected in the log frame tables below:

ARC OUTCOME 3: Outputs, Output Indicators and Annual Targets

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|--|-------------------------------|---|--|----------------------------|---------|---------|-----------------------|---------------------|---------|---------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 3. Improved nutritional value, quality and safety of agricultural products | Crop Sciences | Broadening the food base | Number of cultivars registered | 103 | 50 | 61 | 61 | 0 | 4 | 2 |
| | | | Number of field trials | 12 | 12 | 2 | 5 | 2 | 2 | 2 |
| | | | Number of technical reports | 190 | 162 | 125 | 112 | 98 | 99 | 94 |
| | | | Number of cultivar evaluations | 0 | 0 | 0 | 4 | 60 | 64 | 54 |
| | | | Number of new products developed | 0 | 0 | 0 | 1 | 0 | 6 | 6 |
| | | | Number of services rendered | 0 | 0 | 0 | 16 | 14 | 15 | 18 |
| | | Post-harvest handling and agro-processing | Number of cultivars developed with improved shelf life | 0 | 0 | 1 | 6 | 1 | 1 | 1 |
| | | | Number of new post-harvest solutions developed | 0 | 4 | 4 | 2 | 2 | 1 | 1 |
| | | | Number of solutions for controlled atmosphere | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| | | | Number of services rendered | 0 | 0 | 0 | 15 | 47 | 47 | 47 |

ARC OUTCOME 3: Output Indicators, Annual and Quarterly Targets

| RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | 2021/22 ANNUAL TARGET | QUARTERLY TARGETS | | | |
|-------------------------------|---|--|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | Q1 Apr - Jun 2021 | Q2 Jul - Sep 2021 | Q3 Oct - Dec 2021 | Q4 Jan - Mar 2022 |
| Crop Sciences | Broadening the food base | Number of cultivars registered* | 0 | 0 | 0 | 0 | 0 |
| | | Number of field trials | 2 | 0 | 0 | 2 | 0 |
| | | Number of technical reports | 98 | 17 | 27 | 37 | 17 |
| | | Number of cultivar evaluations | 60 | 15 | 15 | 15 | 15 |
| | | Number of new products developed* | 0 | 0 | 0 | 0 | 0 |
| | | Number of services rendered | 14 | 1 | 1 | 6 | 6 |
| Animal Sciences | Post-harvest handling and agro-processing | Number of cultivars developed with improved shelf life | 1 | 0 | 0 | 0 | 1 |
| | | Number of new post-harvest solutions developed | 2 | 0 | 0 | 1 | 1 |
| | | Number of solutions for controlled atmosphere* | 0 | 0 | 0 | 0 | 0 |
| | | Number of services rendered | 47 | 7 | 12 | 14 | 14 |

*Targets are for the outer years (2022/23, 2023/24)

ARC OUTCOME 3: EXPLANATION OF PLANNED PERFORMANCE OVER THE MEDIUM-TERM PERIOD

The Outcome is aligned to ARC Vision 2050 through a focus on the research, development, and dissemination of solutions, processes, and technologies for enhancing the agriculture value chain, and supporting inclusive market-orientated development for smallholder farmers, agri-businesses, and enterprises in the agriculture value chain.

For the 5-year period to 2025, the research and development priorities of Outcome 3 are:

- 1) Biotechnology and informatics processes to improve food safety, quality and improved efficiencies in the agriculture value chain
- 2) Product development and value adding (storage, processing and packaging)
- 3) Additional research focus areas include indigenous and high value products (indigenous herbal teas, medicinal and aromatic plants, fruits vegetables) to access niche product value chains
- 4) Animal agriculture research groups conduct research primarily investigating the various factors involved in producing good quality meat, meat products, milk and milk products (safe, appealing, nutritious, affordable and tasteful)
- 5) Research into the processes involved in maximising yield without forfeiting quality and adding value to a basic product to increase quality and/or yield

Key enablers to support delivery of the Outcome include:

- 1) Financial resources;
- 2) Human resources;
- 3) Equipment;
- 4) Internal policies and operating procedures;
- 5) Land and buildings;
- 6) Enabling policies and regulations from government;
- 7) Enabling support and facilitation by the shareholder;
- 8) Stakeholder mobilisation and partnerships, and
- 9) Industry buy-in (farmers).

ARC OUTCOME 3: RESOURCE CONSIDERATIONS

Financial Resources

| DIVISION | AMOUNT IN R '000 |
|------------------------|------------------|
| Crop Sciences | 36 606 |
| Total expenses: | 36 606 |

Human Resources

| DIVISION | RESEARCHERS | RESEARCHER SUPPORT | OTHER SUPPORT |
|---------------|-------------|--------------------|---------------|
| Crop Sciences | 70 | 69 | 50 |

5.4. ARC OUTCOME 4: A SKILLED AND CAPABLE AGRICULTURE SECTOR

ARC OUTCOME 4: FOCUS AND PRIORITIES AND CONTRIBUTING DIVISIONS

The focus of Outcome 4 is to provide strategies, analysis and information to develop and grow a competitive, productive, and diverse agricultural sector, and provide a support service to identify and develop the commercial potential of agricultural research and development to address smallholder and commercial farmer constraints.

Agricultural excellence depends on the organisation's skilled human resources and this is important for establishing sustainable growth in the South African agricultural economy. In order for the ARC to achieve this, specialist and postgraduate training of students and staff is crucial and underpins the diagnostic and research activities of the ARC. This knowledge enhancement will ensure that the ARC has a critical mass of scientists to contribute to the continuity of the research and development agenda of the organisation.

The Outcome further focuses on the implementation of initiatives to address smallholder farmer constraints in terms of access to resources (technology, information, etc.). This includes the packaging, exploitation and licencing of ARC research and development outcomes to enhance the capacity and skills of farmers, extension personnel, processors, and enterprises through facilitating the utilisation of ARC intellectual property.

The ARC is dedicated to providing unparalleled personalised education and training for the farming sector in addition to conveying management solutions to assist the wide spectrum of the veterinary and associated professions.

This will ensure that the ARC is better placed to disseminate and transfer the knowledge generated to farmers and extension agents for a sustainable agricultural sector and a food secure South Africa. The dissemination of the generated knowledge through scientific and other popular publications are a key output of the ARC, and will ensure an informed society, thereby enhancing the visibility of the organisation.

Outcome 4 is aligned to the 2019-2024 Medium Term Strategic Framework (MTSF) and the strategic priorities and outcomes of the DALRRD and DSI as follows:

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|--|--|--|--|
| Priority 2: Economic transformation and job creation: <u>2024 Impact:</u> <ul style="list-style-type: none"> Unemployment reduced to 20%-24% 2 million new jobs especially for youth | Outcome 1: More decent jobs created and sustained, with youth, women and persons with disabilities prioritised: <ul style="list-style-type: none"> Create jobs through Job Summit Commitments, Operation Phakisa and other public sector employment programmes Outcome 5: Reduce concentration and monopolies and expanded small business sector: <ul style="list-style-type: none"> Facilitate the increase in number of functional small businesses with a focus on township economies and rural development Outcome 10: Increased economic participation, ownership, access to resources, opportunities and wage equality for women, youth and persons with disabilities: <ul style="list-style-type: none"> Expand government spend on women, youth and persons with disabilities through preferential procurement | Outcome 3: Redress and equitable access to land and producer support: <ul style="list-style-type: none"> Number of smallholder producers commercialised Skilled and employable youth in the agriculture sector Outcome 5: Increased market access and maintenance of existing markets: <ul style="list-style-type: none"> % increase of domestic use (value added) of agricultural products | Investing for inclusive economic growth: <ul style="list-style-type: none"> Skills Priority Plan developed by 2020 - led by DHET and supported by DSI Improve competitiveness through ICT adoption: <ul style="list-style-type: none"> GERD of 1.1% as a percentage of GDP by 2024 Commercialisation of intellectual property |
| Priority 3: Education, Skills and Health: <u>2024 Impact:</u> <ul style="list-style-type: none"> A skilled and capable workforce to support an inclusive growth path | Outcome 1: Expanded access to PSET opportunities: <ul style="list-style-type: none"> Implement enrolment plans for universities, TVET, CETCs and training (2020-2024) Outcome 3: Improved quality of PSET provisioning: <ul style="list-style-type: none"> Develop standards for good governance in public TVET Colleges, CETCs, Universities and SETAs Outcome 4: A responsive PSET system: <ul style="list-style-type: none"> Industry exposure for TVET College lecturers and students | Outcome 3: Redress and equitable access to land and producer support: <ul style="list-style-type: none"> Number of smallholder producers commercialised Skilled and employable youth in the agriculture sector | Expanded access to PSET opportunities: <ul style="list-style-type: none"> # of PhD students awarded bursaries # of pipeline postgraduate students awarded bursaries by NRF and DSI Improved quality of PSET provisioning: <ul style="list-style-type: none"> # of emerging researcher grants to improve % of PhD qualified staff A responsive PSET system: |

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|--|--|---|---|
| | <ul style="list-style-type: none"> CET college skills programme piloted around community needs | | <ul style="list-style-type: none"> # of users from the education and research sector supported through SANReN # of graduates and students placed in DSI funded work opportunities # of IP awareness sessions in TVET colleges # of people reached through outreach, awareness and training programmes |
| <p>Priority 5: Spatial integration, human settlement and local government:</p> <p><u>2024 Impact:</u></p> <ul style="list-style-type: none"> Rapid land and agrarian reform contributing to reduced asset inequality, equitable distribution of land and food security | <p>Outcome 7: Sustainable land reform:</p> <ul style="list-style-type: none"> Land reform projects provided with post-settlement support. <p>Outcome 8: Agrarian Transformation:</p> <ul style="list-style-type: none"> Smallholder farmers supported for food production and commercial activities Smallholder farmers supported with skills and infrastructure and financial support measures to increase productivity Agri-hubs and agro-processing facilities established <p>Outcome 9: Effective regulatory framework of agricultural produce and exports:</p> <ul style="list-style-type: none"> Review the standards on SAGAP and Global GAP to enable smallholder farmers' participation in the domestic and global GAP Governance and operational review of the National Fresh Produce Markets, and Agency role in market access for small farm holders' participation | <p>Outcome 6: Integrated and inclusive rural economy:</p> <ul style="list-style-type: none"> Provide support to rural enterprises and industries in areas with economic opportunities Increase job opportunities and ensure skills development Facilitate infrastructure development to support rural economic transformation | <p>Inclusive rural economy:</p> <ul style="list-style-type: none"> Provision of applications and products for precision agriculture, human settlement and water bodies information layers Demonstrations in partnership with the Department of Mineral Resources and Energy to assess the appropriateness of new technologies such hydrogen fuel cells to improve service delivery |

Outcome 4 is the focus of the following ARC Divisions:

- 1) Crop Sciences;
- 2) Animal Sciences;
- 3) Research and Innovation Systems, and
- 4) Impact and Partnerships.

ARC OUTCOME 4: OUTPUTS, OUTPUT INDICATORS AND TARGETS

In contributing towards the ARC's desired impact of **“sustainable agricultural systems for agrarian transformation, food and nutrition security”**, the 2021/22 Performance Plan for Outcome 4 is reflected in the log frame tables below:

ARC OUTCOME 4: Outputs, Output Indicators and Annual Targets

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|---|--|------------------------------|--|----------------------------|--------------|--------------|-----------------------|---------------------|---------|---------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 4. A skilled and capable agriculture sector through innovation, knowledge and technologies | Crop Sciences Animal Sciences RIS Impact and Partnerships | Skills development | Number of people trained | 856 | 712 | 525 | 417 | 328 | 382 | 406 |
| | | | Number of Postgraduate students supported by ARC | 22 | 42 | 30 | 38 | 23 | 40 | 40 |
| | | Technology Transfer | Number of technologies/IP registered/developed | 6 | 6 | 6 | 9 | 3 | 4 | 3 |
| | | | Number of enterprises supported | Not measured | Not measured | Not measured | 4 | 3 | 3 | 3 |
| | | | Number of technologies transferred under license | 0 | 0 | 0 | 30 | 30 | 30 | 30 |
| | | Smallholder farmer supported | Number of farmers trained | 1 246 | 1 023 | 792 | 700 | 765 | 870 | 954 |
| | | | Number of technical assessments for commercial readiness | Not measured | Not measured | Not measured | 20 | 30 | 40 | 50 |
| | | | Number of smallholder farmers participating in KyD | 8 676 | 1 726 | 3 000 | 3 500 | 4000 | 4500 | 5000 |
| | | | Number of services rendered | 110 | 110 | 125 | 132 | 129 | 124 | 131 |
| | | | Number of farmer field days | 46 | 30 | 28 | 2 | 3 | 4 | 3 |

ARC: Annual Performance Plan 2021/22

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|---|---|---------------------------------------|-----------------------------------|----------------------------|--------------|--------------|-----------------------|---------------------|---------|---------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 4. A skilled and capable agriculture sector through innovation, knowledge and technologies | Crop Sciences Animal Sciences RIS | Farmer support | Number of farm assessments | Not measured | Not measured | Not measured | 53 | 30 | 35 | 40 |
| | | | Number of farmers supported | 958 | 2096 | 380 | 211 | 154 | 238 | 283 |
| | | | Number of farmer field days | 46 | 30 | 28 | 37 | 68 | 22 | 53 |
| | | | Number of services rendered | 13 | 8 | 5 | 20 | 85 | 93 | 99 |
| | Impact and Partnerships | Knowledge generated and dissemination | Number of scientific publications | 267 | 265 | 227 | 237 | 234 | 245 | 253 |
| | | | Number of popular publications | 218 | 175 | 171 | 203 | 204 | 189 | 224 |
| | | | Number of public awareness events | Not measured | Not measured | Not measured | 169 | 72 | 198 | 200 |

*Targets are for the outer years (2022/23, 2023/24)

ARC OUTCOME 4: Output Indicators, Annual and Quarterly Targets

| RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | 2021/22 ANNUAL TARGET | QUARTERLY TARGETS | | | |
|--|---------------------------------------|--|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | Q1 Apr - Jun 2021 | Q2 Jul - Sep 2021 | Q3 Oct - Dec 2021 | Q4 Jan - Mar 2022 |
| Crop Sciences Animal Sciences RIS Impact and Partnerships | Skills development | Number of people trained: | 328 | 41 | 82 | 93 | 112 |
| | | Number of Postgraduate students supported by ARC | 23 | 9 | 4 | 4 | 6 |
| | Technology Transfer | Number of technologies/IP registered/developed | 3 | 0 | 0 | 2 | 1 |
| | | Number of enterprises supported | 3 | 0 | 0 | 0 | 3 |
| | | Number of technologies transferred under license | 30 | 0 | 15 | 10 | 5 |
| | Smallholder farmer supported | Number of farmers trained | 765 | 135 | 160 | 165 | 305 |
| | | Number of technical assessments for commercial readiness | 30 | 5 | 5 | 10 | 10 |
| | | Number of smallholder farmers participating in KyD | 4000 | 500 | 1500 | 1500 | 500 |
| | | Number of services rendered | 129 | 20 | 41 | 46 | 22 |
| | | Number of farmer field days | 3 | 0 | 0 | 1 | 2 |
| | Farmer support | Number of farm assessments | 30 | 6 | 8 | 9 | 7 |
| | | Number of farmers supported | 154 | 27 | 27 | 27 | 73 |
| | | Number of farmer field days | 68 | 12 | 12 | 25 | 19 |
| | | Number of services rendered | 85 | 20 | 21 | 22 | 22 |
| | Knowledge generated and dissemination | Number of scientific publications | 234 | 44 | 51 | 57 | 82 |
| | | Number of popular publications | 204 | 39 | 53 | 46 | 66 |
| | | Number of public awareness events | 72 | 11 | 20 | 20 | 21 |

ARC OUTCOME 4: EXPLANATION OF PLANNED PERFORMANCE OVER THE MEDIUM-TERM PERIOD

The Outcome is aligned to ARC Vision 2050 through a focus on supporting inclusive market-orientated development for smallholder farmers, agri-businesses and enterprises in the agriculture value chain.

For the 5-year period to 2025, the priorities and focus of Outcome 4 are to:

- 1) Address smallholder constraints in terms of access to resources such as technology, information and training;
- 2) Support the ARC priority focus on R&D output that deals specifically with smallholder and resource-poor farmer development, significantly increasing the ARC support to all smallholder farmers, including land reform beneficiaries and communal farmers;
- 3) Utilise the Farming Systems Research (FSR) approach, dealing in a holistic manner with the complex constraints of smallholder and resource poor farmers;
- 4) Protect and commercialise the IP generated by ARC R&D programmes, with a view to grow a competitive and diverse agricultural sector;
- 5) Provide customised solutions to specific farmer groups, supporting enterprise growth and development leading to food security, sustainable profitability and competitiveness;
- 6) Ensure a correct balance between technologies issued by the ARC under license for income and technologies issued under license royalty free, aimed at benefiting resource poor and marginalised farmers, and promoting socio-economic development;
- 7) Deliver training and information to farmers and extension personnel for skills development and better decision making, and to develop enhanced dissemination platforms for use by the ARC, and
- 8) Focus on capacity building, the transfer of technical skills through the provision of training courses and the development and dissemination of information resources to improve decision-making and risk mitigation by farmers.

Key enablers to support delivery of the Outcome include:

- 1) Financial resources;
- 2) Human resources;
- 3) Equipment;
- 4) Internal policies and operating procedures;
- 5) Land and buildings;
- 6) Enabling policies and regulations from government;
- 7) Enabling support and facilitation by the shareholder;
- 8) Stakeholder mobilisation and partnerships, and
- 9) Industry buy-in (farmers).

ARC OUTCOME 4: RESOURCE CONSIDERATIONS

Financial Resources

| DIVISION | AMOUNT IN R '000 |
|------------------------|------------------|
| Crop Sciences | 231 188 |
| Animal Sciences | 3 272 |
| RIS | 39 454 |
| Total expenses: | 273 913 |

Human Resources

| DIVISION | RESEARCHERS | RESEARCH SUPPORT | OTHER SUPPORT |
|-----------------|-------------|------------------|---------------|
| Crop Sciences | 68 | 38 | 214 |
| Animal Sciences | 98 | 123 | 13 |
| RIS | 100 | 27 | 45 |

5.5. ARC OUTCOME 5: ENHANCED RESILIENCE OF AGRICULTURE

ARC OUTCOME 5: FOCUS AND PRIORITIES AND CONTRIBUTING DIVISIONS

The focus of Outcome 5 is to enhance the resilience of the Agriculture sector to factors such as Climate Change. The weather variability and climate change have a direct impact on food security, especially in semi-arid and arid countries.

The Outcome focuses on climate monitoring for agriculture and the effective maintenance of an operational national agro-climate weather station network for effective provision of weather and climate related services.

In addition, infectious animal disease agents including bacteria, viruses and parasites, evolve in response to pressures that include immunologic and antimicrobial agents. The ARC provide effective and efficient diagnostic and analytical services and a wide range of applied research and consultancy services on livestock diseases at local, provincial, national, and regional levels. The excellent veterinary research focuses on the development and improvement of diagnostic and analytical services and applying the latest biological techniques. The development of vaccines to improve the health of the national herd through the prevention of key important diseases for the region is vitally important.

The rapidly changing climate and associated impact on rangelands has serious implication for livestock agriculture. Research in sustainable utilisation and conservation strategies to maintain biodiversity in the rangeland agro-ecological system is an area of both scientific, economic and environmental importance. Specifically, mitigation of emerging threats to rangeland biodiversity as manifested by unsustainable grazing strategies requires better understanding of the agro-ecological system for sustainable utilisation of rangeland. Some of the strategic research in this area include use of encroaching woody plants (e.g. *Seriphium plumosum*, common name: Bankrupt bush) as feed ingredients for feed formulation.

Outcome 5 is aligned to the 2019-2024 Medium Term Strategic Framework (MTSF) and the strategic priorities and outcomes of the DALRRD and DSI as follows:

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|---|---|--|--|
| <p>Priority 5: Spatial integration, human settlement and local government:</p> <p><u>2024 Impact:</u></p> <ul style="list-style-type: none"> ▪ Institutionalise spatial / territorial integration to fast track transformation and resilience of sub-national regions ▪ Natural Resources are managed and sectors and municipalities are able to respond to the impact of climate change | <p>Outcome 2: Functional Sub-National Regional Development in Urban and Rural Spaces:</p> <ul style="list-style-type: none"> - Establish regional institutional collaboration structures through joint implementation protocols or related mechanisms <p>Outcome 4: Greenhouse Gas Emission Reduction (Mitigation):</p> <ul style="list-style-type: none"> - Implement 4 sectors Green House Gas emission reduction implementation plan (contribution from the largest emitters of GHG) - Transition plans for high carbon emitting sectors (energy, transport, agriculture and waste to low carbon economy), developed by 2024 <p>Outcome 6: State of ecological infrastructure improved:</p> <ul style="list-style-type: none"> - Rapidly and intensively rehabilitate and restore land - Water resource classes and Resource Quality Objectives (RQOs) by 2024 <p>Outcome 7: Sustainable land reform:</p> <ul style="list-style-type: none"> - Land reform projects provided with post-settlement support. <p>Outcome 8: Agrarian Transformation:</p> <ul style="list-style-type: none"> - Degraded land rehabilitated to production <p>Outcome 11: Effective water management system for the benefit of all:</p> <ul style="list-style-type: none"> - Feasibility studies for rehabilitation vs new dams - Review current Water Legislations | <p>Outcome 2: Spatial transformation and effective land administration:</p> <ul style="list-style-type: none"> - Effective application of spatial development planning and land use management - Legally secure tenure to all citizens - Integrated land administration system <p>Outcome 6: Integrated and inclusive rural economy:</p> <ul style="list-style-type: none"> - Provide support to rural enterprises and industries in areas with economic opportunities - Increase job opportunities and ensure skills development - Facilitate infrastructure development to support rural economic transformation | <p>Inclusive rural economy:</p> <ul style="list-style-type: none"> - Provision of applications and products for precision agriculture, human settlement and water bodies information layers - Demonstrations in partnership with the Department of Mineral Resources and Energy to assess the appropriateness of new technologies such as hydrogen fuel cells to improve service delivery <p>Reduced Vulnerability of Key Sectors to Climate Change:</p> <ul style="list-style-type: none"> - Provide information for air quality information system, land cover and land use mapping, frequent information on weather patterns, and human activity on critical resources such as water, land and air - Provision of decision support tools, human settlements layer, water bodies information layer |

Outcome 5 is the focus of the following ARC Divisions:

- 1) Crop Sciences;
- 2) Animal Sciences, and
- 3) Research and Innovation Systems.

ARC OUTCOME 5: OUTPUTS, OUTPUT INDICATORS AND TARGETS

In contributing towards the ARC's desired impact of “**sustainable agricultural systems for agrarian transformation, food and nutrition security**”, the 2021/22 Performance Plan for Outcome 5 is reflected in the log frame tables below:

ARC OUTCOME 5: Outputs, Output Indicators, and Annual Targets

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|---------------------------------------|---|-----------------------------|---|----------------------------|--------------|--------------|-----------------------|---------------------|---------|---------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 5. Enhanced resilience of agriculture | Crop Sciences Animal Sciences RIS | Climate resilient solutions | Number of climate resilient solutions adopted | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | Number of drought tolerant cultivars | 0 | 0 | 0 | 3 | 1 | 2 | 2 |
| | | | Number of services rendered | 0 | 0 | 0 | 5 | 5 | 8 | 8 |
| | | | Number of technical reports | 12 | 14 | 9 | 10 | 10 | 13 | 11 |
| | | | Number of field trials | 0 | 0 | 0 | 105 | 95 | 105 | 104 |
| | | | Number of tools for measuring climate change | Not measured | Not measured | Not measured | 401 | 281 | 321 | 321 |
| | | Vaccine production | Number of blood vaccine doses produced | 374 803 | 186 555 | 241 215 | 235 200 | 235 000 | 235 000 | 235 000 |
| | | | Number of different types of vaccines developed | Not measured | Not measured | Not measured | 4 | 0 | 0 | 0 |
| | | | Number of FMD vaccine doses produced | Not measured | Not measured | Not measured | 50 000 | 0 | 0 | 0 |
| | | | Number of vaccine clinical trials | Not measured | Not measured | Not measured | 2 | 0 | 0 | 0 |
| | | Laboratory services | Number of tests performed for animal health | 20 052 | 17 255 | 12 416 | 215 350 | 15 006 | 15 008 | 16 010 |
| | | | Number of tests performed for food and feed | 3 226 | 3 632 | 3 000 | 2 006 | 2 255 | 2 355 | 2 460 |
| | | | Number of services rendered | 0 | 0 | 0 | 0 | 150 | 200 | 200 |
| | | | Number of technical reports | 0 | 0 | 0 | 5 | 7 | 6 | 6 |

ARC OUTCOME 5: Output Indicators, Annual and Quarterly Targets

| RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | 2021/22 ANNUAL TARGET | QUARTERLY TARGETS | | | |
|-------------------------------|-----------------------------|--|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | Q1 Apr - Jun 2021 | Q2 Jul - Sep 2021 | Q3 Oct - Dec 2021 | Q4 Jan - Mar 2022 |
| Crop Sciences | Climate resilient solutions | Number of climate resilient solutions adopted | 3 | 0 | 0 | 0 | 3 |
| | | Number of drought tolerant cultivars | 1 | 0 | 0 | 0 | 1 |
| | | Number of services rendered | 5 | 0 | 1 | 2 | 2 |
| | | Number of technical reports | 10 | 2 | 2 | 2 | 4 |
| | | Number of field trials | 95 | 0 | 1 | 0 | 94 |
| | | Number of tools for measuring climate change | 281 | 0 | 0 | 0 | 281 |
| Animal Sciences | Vaccine production | Number of blood vaccine doses produced | 235 000 | 40 000 | 70 000 | 70 000 | 55 000 |
| | | Number of different types of vaccines developed* | 0 | 0 | 0 | 0 | 0 |
| | | Number of FMD vaccine doses produced* | 0 | 0 | 0 | 0 | 0 |
| | | Number of vaccine clinical trials* | 0 | 0 | 0 | 0 | 0 |
| RIS | Laboratory services | Number of tests performed for animal health | 15 006 | 2 002 | 4 501 | 5 501 | 3 002 |
| | | Number of tests performed for food and feed | 2 255 | 510 | 515 | 515 | 715 |
| | | Number of services rendered | 150 | 50 | 25 | 50 | 25 |
| | | Number of technical reports | 7 | 1 | 0 | 1 | 5 |

*Targets are for the outer years (2022/23, 2023/24)

ARC OUTCOME 5: EXPLANATION OF PLANNED PERFORMANCE OVER THE MEDIUM-TERM PERIOD

The Outcome is aligned to ARC Vision 2050 through a focus on the research, development, and dissemination of solutions, processes, and technologies for the anticipation and mitigation of agricultural risks.

For the 5-year period to 2025, the research and development priorities of Outcome 5 are:

- 1) Climate variability and change adaptation;
- 2) Development of agricultural decision support tools and services;
- 3) Development of AgroClimate web and cellphone application;
- 4) Climate-based solutions for food security and mitigating extreme weather events;
- 5) Vaccine production and diagnostic and analytical services;
- 6) Development of crop suitability parameters, and
- 7) Development of early warning systems (drought, floods, pests & diseases, animal stress).

Key enablers to support delivery of the Outcome include:

- 1) Financial resources;
- 2) Human resources;
- 3) Equipment;
- 4) Internal policies and operating procedures;
- 5) Land and buildings;
- 6) Enabling policies and regulations from government;
- 7) Enabling support and facilitation by the shareholder;
- 8) Stakeholder mobilisation and partnerships, and
- 9) Industry buy-in (farmers).

ARC OUTCOME 5: RESOURCE CONSIDERATIONS

Financial Resources

| DIVISION | AMOUNT IN R '000 |
|------------------------|------------------|
| Crop Sciences | 533 |
| Animal Sciences | 401 388 |
| RIS | 39 454 |
| Total expenses: | 441 375 |

Human Resources

| DIVISION | RESEARCHERS | RESEARCH SUPPORT | OTHER SUPPORT |
|-----------------|-------------|------------------|---------------|
| Crop Sciences | 7 | 5 | 5 |
| Animal Sciences | 42 | 36 | 8 |
| RIS | 100 | 27 | 45 |

5.6. ARC OUTCOME 6: A HIGH-PERFORMING AND SUSTAINABLE ORGANISATION

ARC OUTCOME 6: FOCUS AND PRIORITIES AND CONTRIBUTING DIVISIONS

Outcome 6 is the platform for delivery against the ARC mission and the realisation of the ARC impact. The focus of Outcome 6 is to ensure:

- 1) Addressing the current working capital gap and financial position through the implementation of the targeted and robust Sustainability and Turnaround Plan; and
- 2) Ensuring excellence in scientific research and development through enhanced capacity, capabilities and appropriate organisational technology and infrastructure.

The Outcome focuses on improving organisational effectiveness and efficiency towards a sustainable ARC. It includes promoting public accountability, achieving high standards of corporate governance and efficient resource utilisation, strengthened revenue generation and productivity, and good stakeholder engagement to ensure optimal organisational performance, visibility and service delivery.

While supporting delivery of the other five (5) ARC outcomes, the specific contribution of Outcome 6 to the 2019-2024 Medium Term Strategic Framework (MTSF) and the strategic priorities and outcomes of the DALRRD and DSI is as follows:

| RELEVANT MTSF PRIORITY AND IMPACT | RELEVANT MTSF OUTCOMES AND INTERVENTIONS | DALRRD STRATEGIC PLAN RESPONSE | DSI STRATEGIC PLAN RESPONSE |
|--|--|---|--|
| <p>Priority 1: Building a capable, ethical and developmental State:</p> <p><u>2024 Impact:</u></p> <ul style="list-style-type: none"> Public value and trust Active citizenry and partnerships in society | <p>Outcome 1: Improved governance and accountability:</p> <ul style="list-style-type: none"> Strengthen the governance system of state owned entities <p>Outcome 2: Functional, efficient and integrated government:</p> <ul style="list-style-type: none"> Enhance productivity and functionality of public sector institutions in supporting people-centered service delivery Improve financial management capability in the public sector Measures taken to reduce wasteful and fruitless expenditures; and irregular expenditure in the public sector <p>Outcome 3: Professional, meritocratic and ethical public administration:</p> <ul style="list-style-type: none"> Programme for building a professional public administration <p>Outcome 4: Social compact and engagement with key stakeholders:</p> <ul style="list-style-type: none"> Participatory governance mechanisms and citizen engagement <p>Outcome 5: Mainstreaming of gender, youth and disability, empowerment and development institutionalised:</p> <ul style="list-style-type: none"> Implementation of gender, youth and disability responsive planning, budgeting, interventions, policies and legislations | <p>Outcome 1: Improved governance and service excellence:</p> <ul style="list-style-type: none"> Compliance with legal prescripts Achievement of KPIs Payment of suppliers in 30 days Compliance to performance management framework | <p>A Capable, Ethical and Developmental State:</p> <ul style="list-style-type: none"> Capable and honest Government Gender-responsive planning, budgeting and reporting framework District- Metro Coordination Model to Improve the Coherence and Impact of Government Service Delivery and Development <p>Strengthened government capability to deliver on the developmental agenda:</p> <ul style="list-style-type: none"> Provide timely, accurate and independent data and information for mega projects monitoring and evaluation |

Outcome 6 is delivered by the Corporate Support Divisions of the ARC, namely:

- 1) Office of the CEO;
- 2) Human Resources and Legal Services;
- 3) Impact and Partnerships;
- 4) Finance, and
- 5) ICT and Infrastructure.

The Outcome covers the full range of organisational management and support services and functions, including:

- 1) Corporate governance, financial management and internal controls;
- 2) Human capital management and development;
- 3) Supply chain management and targeted procurement;
- 4) ICT, facilities and assets management,
- 5) International and intergovernmental relations, and
- 6) Strategic marketing, stakeholder management and communications.

OUTCOME 6: OUTPUTS, OUTPUT INDICATORS AND TARGETS

In contributing towards the ARC's desired impact of **“sustainable agricultural systems for agrarian transformation, food and nutrition security”**, the 2021/22 Performance Plan for Outcome 6 is reflected in the log frame tables below:

ARC OUTCOME 6: Outputs, Output Indicators and Annual Targets

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|--|-------------------------------|-----------------------------|---|----------------------------|--------------|--------------|-----------------------|---------------------|---------|---------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 6.A high-performing and sustainable organisation | ICT & Infrastructure | Infrastructure Management | Number of business cases implemented for assets management | 4 | 5 | 4 | 3 | 2 | 2 | 2 |
| | | | Increase in Rand value of rental income | 5% | 14.5% | 3% | 3% | 3% | 3% | 3% |
| | | ICT Strategy Implementation | Number of digital transformation projects implemented | Not measured | Not measured | Not measured | Not measured | 4 | 3 | 3 |
| | | | Number of stabilisation projects implemented | Not measured | Not measured | Not measured | Not measured | 3 | 2 | 2 |
| | | | Number of optimisation projects implemented | Not measured | Not measured | Not measured | Not measured | 3 | 3 | 3 |
| | Human Resources | Human resources Management | Vacancy rate | Not measured | Not measured | Not measured | 5.77% | 5.50% | 5.20% | 5% |
| | | | Support employees as percentage of total staff | Not measured | Not measured | Not measured | 20.60% | 18,50% | 16,70% | 16,00% |
| | | | Percentage increase of employment equity ratio in the designated groups in core business, in respect of: -Women at Senior Management level | Not measured | Not measured | Not measured | 46% | 46% | 46% | 50% |
| | | | - People with Disabilities employed | Not measured | Not measured | Not measured | 1,55% | 1,55% | 1,55% | 1.55% |

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|--|-------------------------------|----------------------------|--|----------------------------|--------------|--------------|-----------------------|---------------------|---------|---------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 6. A high-performing and sustainable organisation | Human Resources | Performance management | Improve the leadership dimensions of 360 degree results of Management, Senior and Executive Management | Not measured | Not measured | Not measured | 3.5 | 3.7 | 3.8 | 4 |
| | | | Alignment of organisational values | Not measured | Not measured | Not measured | 100% | 100% | 100% | 100% |
| | | | Percentage implementation of change management strategies linked to culture survey and 360 degree leadership processes | Not measured | Not measured | Not measured | Not measured | 100% | 100% | 100% |
| | | Human resource development | Number of employees appointed with Masters degrees | 10 | 9 | 20 | 20 | 20 | 20 | 20 |
| | | | Number of employees appointed with Doctoral degrees | 18 | 12 | 10 | 10 | 10 | 10 | 10 |
| | | | Number of employees with Masters degrees | 239 | 219 | 268 | 268 | 268 | 268 | 268 |
| | | | Number of employees with Doctoral degrees | 246 | 250 | 240 | 240 | 240 | 240 | 240 |
| | | | Percentage staff turnover | 4.06% | 2.65% | 3.50% | 3.5% | 3.5% | 3.5% | 3.5% |
| | | | Total spend on PDP stipend and registration | Not measured | R 15.7mil | R 21.1mil | R 21.1mil | R 10mil | R 7mil | R 5mil |
| | | | Training spend as a % of salary bill | 2% | 1.57% | 2% | 2% | 2% | 2% | 2% |

| OUTCOME | RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | AUDITED ACTUAL PERFORMANCE | | | ESTIMATED PERFORMANCE | MEDIUM-TERM TARGETS | | |
|--|-------------------------------|------------------------------------|--|----------------------------|-----------------|-----------------|-----------------------|---------------------|-------------------|-------------------|
| | | | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| 6. A high-performing and sustainable organisation | Impact and Partnerships | Commercialisation of ARC solutions | Establishment of an ARC commercialisation entity | Not measured | Not measured | Not measured | Entity approved | 1 | | |
| | | Exhibitions and sponsorships | Number of exhibitions, sponsorships | Not measured | Not measured | Not measured | 30 | 5 | 40 | 40 |
| | | International partnerships | Number of new international partnerships | Not measured | Not measured | Not measured | 2 | 2 | 2 | 2 |
| | Finance | Governance | Audit opinion | Qualified audit | Qualified audit | Qualified audit | Unqualified audit | Unqualified audit | Unqualified audit | Unqualified audit |
| | | Funding and revenue generation | Zero Deficit | Not measured | Not measured | Not measured | Zero deficit | Zero deficit | Zero deficit | Zero deficit |
| | | | BBBEE rating | Level 8 | Level 8 | Level 6 | Level 6 | Level 5 | Level 4 | Level 2 |
| | | | External income as % of total revenue | Not measured | Not measured | Not measured | 30% | 35% | 40% | 45% |
| | | | Rand value of royalty income | R16mil | R33mil | R17mil | R20 mil | R20 mil | R23 mil | R20 mil |
| | | Cost efficiencies | Reduction in fixed cost | Not measured | Not measured | Not measured | 5% | 3% | 4% | 5% |
| | | | Personnel costs as % of Operational PG | Not measured | Not measured | Not measured | 80% | 70% | 65% | 60% |

ARC OUTCOME 6: Output Indicators, Annual and Quarterly Targets

| RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | 2021/22 ANNUAL TARGET | QUARTERLY TARGETS | | | |
|-------------------------------|-----------------------------|---|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | Q1 Apr - Jun 2021 | Q2 Jul - Sep 2021 | Q3 Oct - Dec 2021 | Q4 Jan - Mar 2022 |
| ICT & Infrastructure | Infrastructure Management | Number of business cases developed for implementation of assets management plan | 2 | Annual Target | | | |
| | | Increase in Rand value of rental income | 3% | Annual Target | | | |
| | ICT Strategy Implementation | Number of digital transformation projects implemented | 4 | Annual Target | | | |
| | | Number of Stabilisation projects implemented | 3 | Annual Target | | | |
| | | Number of Optimisation projects implemented | 3 | Annual Target | | | |
| Human Resources | Human resources Management | Vacancy rate | 5.50% | Annual Target | | | |
| | | Support employees as percentage of total staff | 18,50% | Annual Target | | | |
| | | Percentage increase of Employment equity ratio in the designated groups in core business, in respect of: Women at Senior Management level | 46% | Annual Target | | | |
| | | - People with Disabilities Employed | 1,55% | Annual Target | | | |
| | Performance management | Improve the leadership dimensions of 360 degree results of Management, Senior and Executive Management | 3.7 | Annual Target | | | |
| | | Alignment of organisational values | 100% | Annual Target | | | |
| | | Percentage implementation of change management strategies linked to culture survey and 360 degree leadership processes | 100% | Annual Target | | | |
| | Human resource development | Number of employees appointed with Masters degrees | 20 | Annual Target | | | |
| | | Number of employees appointed with Doctoral degrees | 10 | Annual Target | | | |
| | | Number of employees with Masters degrees | 268 | Annual Target | | | |
| | | Number of employees with Doctoral degrees | 240 | Annual Target | | | |
| | | Percentage staff turnover | 3.5% | Annual Target | | | |
| | | Total spend on PDP stipend and registration | R 10mil | Annual Target | | | |
| | | Training spend as a % of salary bill | 2% | Annual Target | | | |

ARC: Annual Performance Plan 2021/22

| RESPONSIBLE BUSINESS DIVISION | OUTPUT | OUTPUT INDICATORS | 2021/22 ANNUAL TARGET | QUARTERLY TARGETS | | | |
|-------------------------------|------------------------------------|--|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | Q1 Apr - Jun 2021 | Q2 Jul - Sep 2021 | Q3 Oct - Dec 2021 | Q4 Jan - Mar 2022 |
| Impact and Partnerships | Commercialisation of ARC solutions | Establishment of an ARC commercialisation entity | 1 | Annual Target | | | |
| | Exhibitions and sponsorships | Number of exhibitions, sponsorships | 5 | 0 | 2 | 2 | 1 |
| | International partnerships | Number of new international partnerships | 2 | Annual Target | | | |
| Finance | Governance | Audit opinion | Unqualified audit | Annual Target | | | |
| | | Zero Deficit | Zero deficit | Annual Target | | | |
| | Funding and revenue generation | BBBEE rating | Level 5 | Annual Target | | | |
| | | External income as % of total revenue | 35% | Annual Target | | | |
| | | Rand value of royalty income | R20 mil | Annual Target | | | |
| | | Reduction in fix cost | 3% | Annual Target | | | |
| | Cost efficiencies | Personnel costs as % of Operational PG | 70% | Annual Target | | | |

ARC OUTCOME 6: EXPLANATION OF PLANNED PERFORMANCE OVER THE MEDIUM-TERM PERIOD

Linked to the support services component of ARC Vision 2050, for the 5-year period to 2025 the priorities of Outcome 6 are:

- 1) **Stabilisation:** changing our approach to designing and implementing new ICT solutions by adopting a holistic and long-term approach and prioritising selected capabilities and ensuring ongoing delivery of reliable ICT services;
- 2) **Optimisation / enabling innovation readiness:** preparing the organisation to take advantage of the latest technological advancements by developing strong expertise in facilitating rapid and iterative change, providing secure and flexible integration, and supporting efficient and effective automation;
- 3) **Digital Transformation:** to provide reliable platform for Agri-Tech solutions, we need to improve the way we manage our investment in ICT services by creating a more sustainable ICT services, improving our partnership with government, industry and service providers, and being smarter in the way we engage with business areas. This include adopting *bi-modal* approach, what is also known as *two-speed IT* towards adopting digital transformation;
- 4) **Human Capital:** the challenges facing the organisation, signals a significant change, in particular with the advent of the Fourth Industrial Revolution (4IR), to both the technical ecosystem and the way in which users consume ICT services;
- 5) Maximising income from our assets (i.e. market related leasing);
- 6) Effective management of capital and operational expenditure on maintenance of our assets;
- 7) Implementing an asset management system to effectively control and manage our assets;
- 8) Development of the overarching security plan to secure our strategic / key assets in a cost effective manner;
- 9) Strengthening strategic partnerships with third parties and our key stakeholders (i.e. Government departments and agencies, etc.), and
- 10) Disposing of non-strategic assets.

Key enablers to support delivery of the Outcome include:

- 1) Sound and up to date policies and procedures;
- 2) Sound labour relations and employee wellness;
- 3) Structure and capacitate the organisation as defined by the mandate and strategic framework;
- 4) Improve performance management system, and implementation thereof, to drive performance culture;
- 5) Business processes reengineering and steady roll-out of automated systems to enable core functions, and
- 6) Effective internal communication system is developed and implemented.

6. THE ARC FINANCIAL PLAN AND ANNUAL BUDGET FOR 2021/22 AND THE MTEF

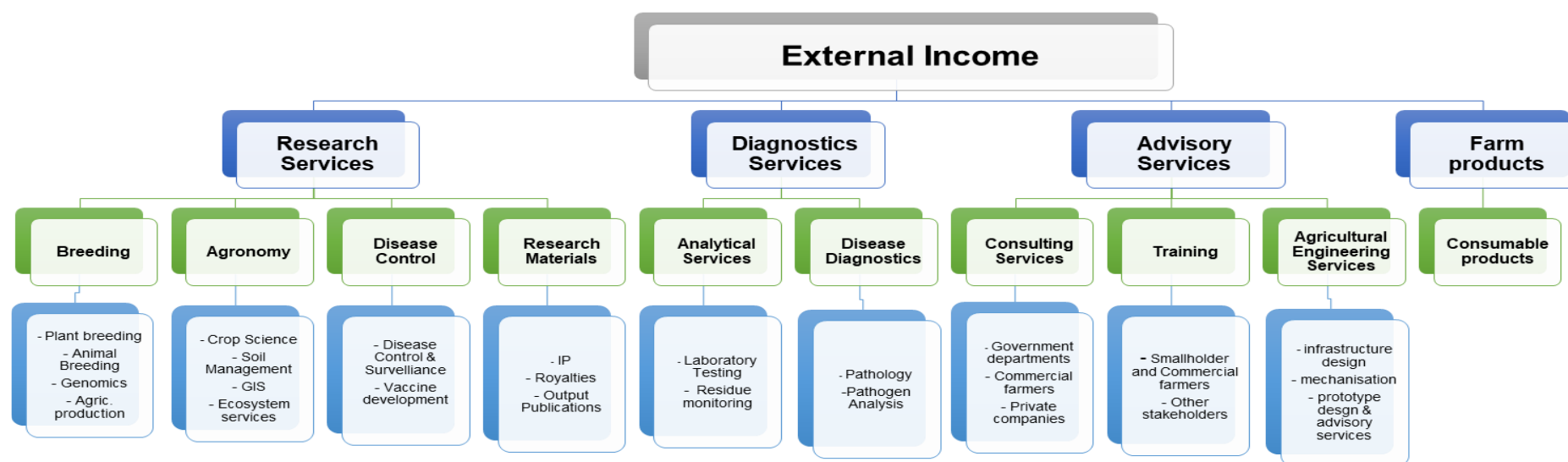
The ARC mandate and funding sources has been static and remained unchanged over the past three decades (1990 to 2020) and as thus, it is outlined below:

The Agricultural Research Council Act of No 86 of 1990³², provides wider options for the financing of the ARC which includes, inter alia, the following: (a) Money appropriated by Parliament to finance the functions of the ARC; (b) Money paid to the ARC arising from the sale on an end-product of research, development and technology transfer; (c) Money received by virtue of contracts and the functions performed by the ARC; (d) money borrowed by the ARC in terms of section 4(1)(m)(ii); (e) fees or royalties; (f) proceeds from sale of shares and dividends on shares; (g) donations or contributions; (h) interests on investments.

The South African businesses and the globe at large operated within the constraints presented by the coronavirus pandemic, which brought almost the world at large to a standstill. Organisations had to adapt to the new way of working with the introduction of work-at-home with new or upgraded technology. We continue to weather Covid-19 impact, which has affected the ARC's ability to generate income whilst introducing additional expenses; which is the cost of compliance to the regulations governing the various levels of lockdown within South Africa. The current economic climate has resulted in the reduction in the Parliamentary Grant funding of R21m implemented during FY2020/21, which was effected against the Personnel Costs. The ARC has received a preliminary Allocation Letter during December 2020 with an allocation over the MTEF period (FY2021/22 to FY2023/24) outlined as follows: R1.282m (FY2021/22); R1.189m (FY2022/23); R1.191m (FY2023/24). FY2021/22 represents the final year (MTEF) that the ARC will be receiving the conditional CAPEX Parliamentary Grant earmarked for the Food and Mouth Disease (FMD) facility, hence the PG allocated is on a declining / downward YoY trend. The External Income has been budgeted at R361.4m (FY2021/22); R377.7m (FY2022/23), and R394.7m (FY2023/24) which represents a sluggish growth as compared to the past financial years trend/(s).

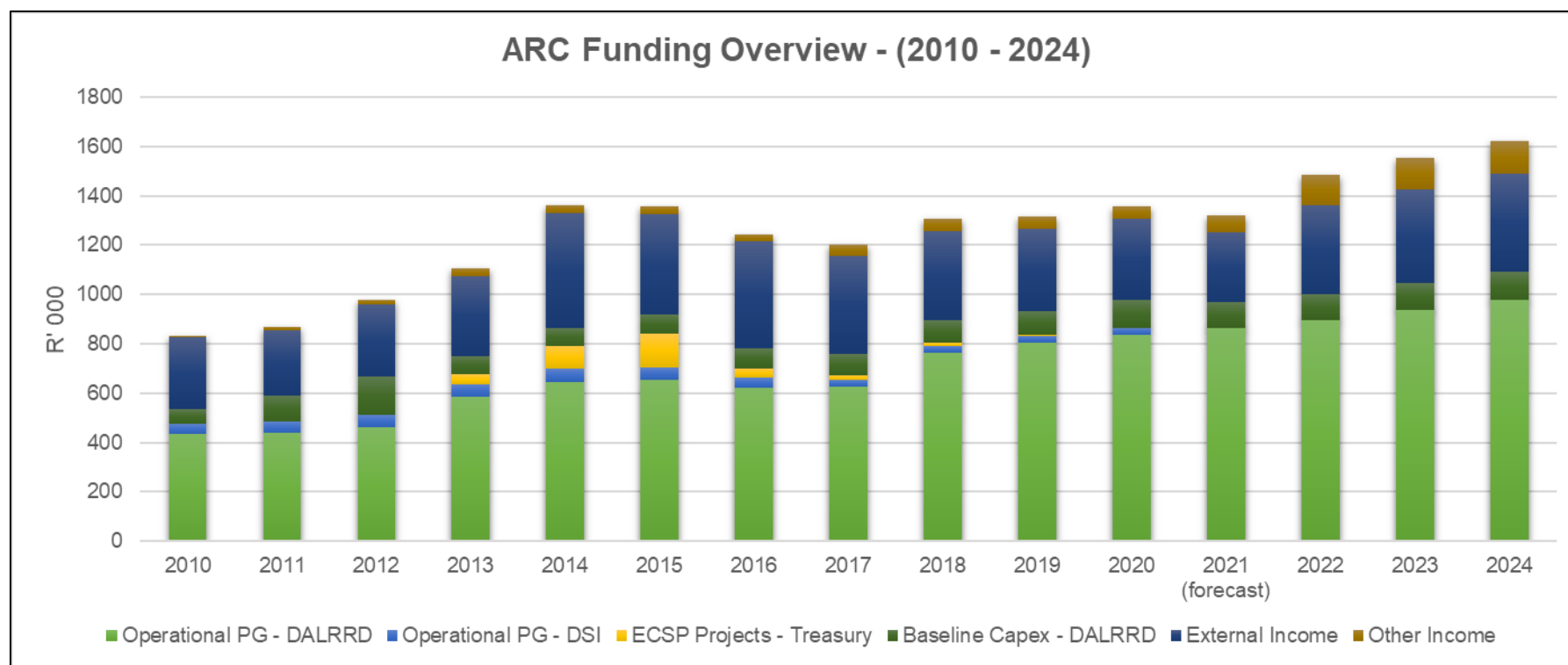
³² Available: <https://www.arc.agric.za/Documents/Agricultural%20Research%20Act%20%2086%20of%201990.pdf>

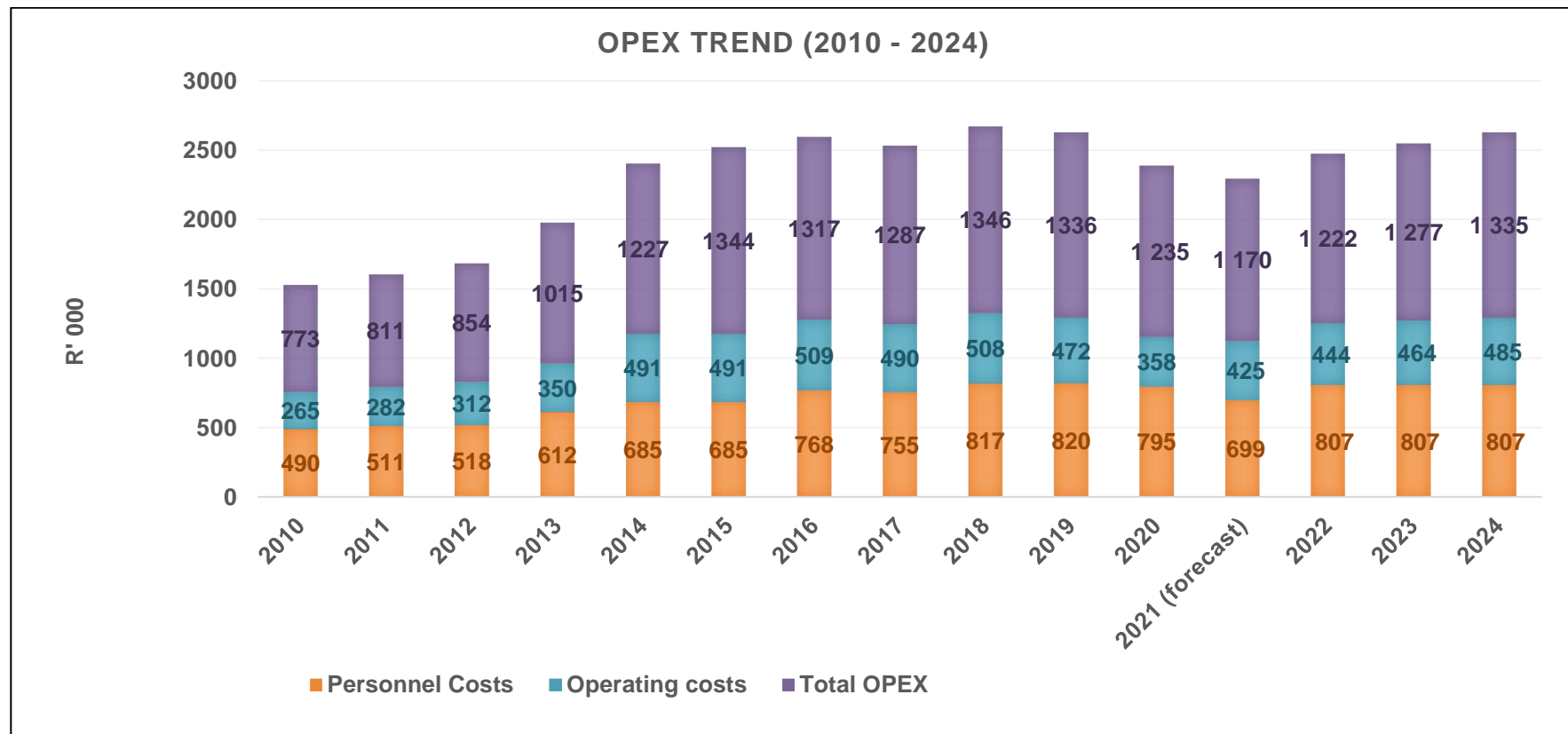
The External Income relates to revenue from contracts for services rendered and produce sold. The external income sources for the ARC are based on four activities or streams namely: Research Services; Diagnostics Services; Advisory Services and Farm product:



The following revenue streams contributes 92% to the total External Income: Research Services (57%); Diagnostics Services (20%); and Advisory Services (15%).

The funding sources, historical and budgeted are outline below, wherein the parliamentary grant continues to be a significant and dominating revenue source:





The ratio of personnel costs in relation to the Parliamentary Grant (PG) remains a concerning factor. Personnel costs continues to absorb a major portion of the operational PG (86%), although the absorption rate during this period is lower than the FY2019/20 absorption rate of 98%. A target that we have set as the ARC is that the personnel costs should absorb 60% of the Operational PG, which is outlined and articulated in the ARC's Financial and Sustainability Turnaround Plan. The ARC based on its baseline Personnel Costs (FY2019), it is targeting to reduce its Personnel Costs by R325 million over an MTEF period. The ARC has non- personnel related cost-savings initiatives, which will focus on reducing the fixed costs that is dominating driver within the Operating Costs.

The ARC has some funds in reserve to be able to move quickly to support key initiatives that are targeted in the ARC's Financial and Sustainability Turnaround Plan:

| NO. | FOCUS AREA | INITIATIVES |
|-----|--|---|
| 1. | Governance and Financial Management | a. Improved governance, which will result in Clean Audit Outcome. b. Improved financial management, which will result in zero deficits. c. Ensure cash resources are preserved to timeously honour obligations; and advanced towards the ARC's strategy execution. |
| 2. | Revenue sources composition and optimisation [Organic growth] | a. Less reliance on the Parliamentary Grant as the main source of funding for the ARC. b. Increase composition of External Income to Total Revenue to 60%. c. Review the Royalties to ensure the ARC earns the highest fees possible, whilst ensuring that the commercial provisions are on par with best practice. d. Agricultural products and services to be well marketed to boost the revenue levels. e. Letting and leasing of properties and accommodation to be concluded at market-related rates. |
| 3. | Growth through acquisitions / partnerships | a. Explore potential equity acquisitions/ joint ventures / public private partnerships; which will enhance the ARC's strategic agenda whilst ensuring compliance with the Public Finance Management Act. |
| 4. | Efficiencies | a. Optimisation of Personnel Costs to Operational Parliamentary Grant (60%); which is equivalent to approximately R320 million personnel cost reduction. b. Value for money (i.e. Return on investments) assessment for subscription / memberships (publications and/or library) vs Utilisation. Including an alternative approach, which may be demand – driven, or collaboration with universities/partners (for mutual benefits). c. Consider the disposal / leasing of unutilized and under-utilised land, and properties. This will result in the reduction on Maintenance Costs. d. Rationalisation of the Institutes / Campuses. This will result in reduction on fixed costs such as security, maintenance, electricity, etc. e. Energy saving projects, which will result in savings on electricity costs. f. Collaborate with ICT on the review of the ERP system, to ensure that all envisaged process efficiencies are achieved through this process. g. Procurement and Sourcing strategies to focus on consolidating the various commodities, whilst approaching the market as one ARC. |
| 5. | Utilisation of the Capital Parliamentary Grant | a. Prioritisation of the Capital PG, to align to the prioritized strategic projects within the ARC. b. Funding of the commercial farms, as an enabler to self-financial sustainability and less reliance on the Parliamentary Grant |

6.1. PROJECTED REVENUE FOR 2021/22 MTEF PERIOD

| AGRICULTURAL RESEARCH COUNCIL BUDGET OVERVIEW FOR THE MTEF PERIOD CONSOLIDATED INCOME AND EXPENDITURE ESTIMATE | | | | |
|---|---|------------------|------------------|------------------|
| | | 2021/22 | 2022/23 | 2023/24 |
| | | R'000 | R'000 | R'000 |
| BASELINE FUNDING | Baseline Allocation - Operational | 816 123 | 842 101 | 843 684 |
| | Baseline Allocation - Capital | 106 432 | 109 820 | 110 027 |
| | Baseline Allocation - FMD Vaccine Facility | 113 044 | - | - |
| | Ncera | 6 521 | 6 728 | 6 741 |
| | Total Baseline Funding | 1 042 120 | 958 649 | 960 451 |
| PROVISION OF NATIONAL SERVICES | Climate Monitoring | 2 258 | 2 330 | 2 334 |
| | SADC Activities (Ring-fenced) | 4 847 | 5 001 | 5 010 |
| | Intergis | 3 223 | 3 325 | 3 332 |
| | Crop Forecasting | 14 928 | 15 403 | 15 432 |
| | Diagnostic Services | 26 633 | 27 481 | 27 532 |
| | Total Other Grants | 51 889 | 53 540 | 53 641 |
| MAINTENANCE OF NATIONAL ASSETS | Gene banks; National Collections; Inventories; Databanks; Surveys and Information Systems - DSI | - | - | - |
| | National Public Goods Assets- DALRRD | 21 324 | 22 002 | 22 044 |
| | Total Funding for National Assets | 21 324 | 22 002 | 22 044 |
| TOTAL GRANTS | PG Excluding VAT | 1 115 332 | 1 034 192 | 1 036 136 |
| | VAT | 167 300 | 155 129 | 155 420 |
| | PG Including VAT | 1 282 632 | 1 189 320 | 1 191 556 |
| BASELINE FUNDING ARC | Total Grants (excl. VAT) | 1 115 332 | 1 034 192 | 1 036 136 |
| | External Income (excl. VAT) | 361 443 | 377 708 | 394 705 |
| | Other Income (excl. VAT) | 121 746 | 127 225 | 132 950 |
| | Total Revenue | 1 598 521 | 1 539 124 | 1 563 791 |

6.2. PROJECTED EXPENDITURE FOR 2021/22 MTEF PERIOD

| AGRICULTURAL RESEARCH COUNCIL BUDGET OVERVIEW FOR THE MTEF PERIOD CONSOLIDATED INCOME AND EXPENDITURE ESTIMATE | | | | |
|--|--|---------------------------|------------------|------------------|
| | | Medium - Term Expenditure | | |
| | | 2021/22 | 2022/23 | 2023/24 |
| | | R'000 | R'000 | R'000 |
| Economic Classification | Compensation of employees | 806 767 | 806 767 | 806 767 |
| | Goods and Services | 488 359 | 510 335 | 533 300 |
| | Use of Infrastructure (Depreciation) | 63 567 | 66 427 | 69 417 |
| | <u>Payment of Capital Assets</u> | | | |
| | Acquisition | 106 432 | 111 222 | 116 227 |
| | FMD - Project related | 50 000 | 119 131 | 178 696 |
| | TOTAL | 1 515 125 | 1 613 882 | 1 704 407 |
| Standard Items of Expenditure | Current | | | |
| | Compensation of Employees - Core Research | 685 752 | 685 752 | 685 752 |
| | Compensation of Employees - Administrative Support | 121 015 | 121 015 | 121 015 |
| | Goods and Services | 488 359 | 510 335 | 533 300 |
| | Use of Infrastructure (Depreciation) | 63 567 | 66 427 | 69 417 |
| | Capital Assets | 156 432 | 230 353 | 294 923 |
| | TOTAL | 1 515 125 | 1 613 882 | 1 704 407 |

6.3. CONSOLIDATED RESOURCES ALLOCATION

| R'000 | Audited Outcomes | | Estimated Expenditure | | MTEF Expenditure Estimates | | |
|---------------------------|------------------|--------------|-----------------------|--------------|----------------------------|--------------|--------------|
| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| Economic classification | | | | | | | |
| Compensation of employees | 806 | 819 | 795 | 699 | 807 | 807 | 807 |
| Goods and Services | 541 | 520 | 440 | 471 | 552 | 577 | 603 |
| Total expenses: | 1 347 | 1 339 | 1 235 | 1 170 | 1 359 | 1 384 | 1 409 |
| Staff complement (no.) | 2 327 | 2 287 | 2 542 | 2 649 | 2 649 | 2 649 | 2 649 |

6.4. CONSOLIDATED FINANCIAL STATEMENTS OVERVIEW

| AGRICULTURAL RESEARCH COUNCIL - THREE YEAR REVIEW | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|
| Statement of Financial Performance | | | | | |
| | Audited | Forecast | Budget | Budget | Budget |
| | 2020 | 2021 | 2022 | 2023 | 2024 |
| | R'm | R'm | R'm | R'm | R'm |
| Total Income | 1 355 | 1 322 | 1 485 | 1 552 | 1 622 |
| Parliamentary Grant | 977 | 969 | 1 002 | 1 047 | 1 095 |
| Baseline - Operational | 864 | 865 | 896 | 936 | 978 |
| Baseline - Capital | 113 | 104 | 106 | 111 | 116 |
| External Income | 331 | 284 | 361 | 378 | 395 |
| Other Income | 47 | 68 | 122 | 127 | 133 |
| Total expenditure | 1 235 | 1 170 | 1 359 | 1 384 | 1 409 |
| Personnel Costs | 795 | 699 | 807 | 807 | 807 |
| Operating Expenditure | 358 | 425 | 488 | 510 | 533 |
| Depreciation | 82 | 46 | 64 | 66 | 69 |
| Interest Paid | 0 | 0 | 0 | 0 | 0 |
| Net Surplus/(Deficit) | 120 | 152 | 127 | 169 | 213 |
| Capital Expenditure | (113) | (104) | (106) | (111) | (116) |
| Net Operational Surplus/(Deficit) | 7 | 48 | 20 | 58 | 96 |

| Statement of Financial Position | | | | | |
|--|------------------------|-------------------------|-------------------------|------------------|------------------|
| | Audited 2019/20 | Forecast 2020/21 | Budgeted 2021/22 | 2022/23 | 2023/24 |
| | R'000 | R'000 | R'000 | R'000 | R'000 |
| ASSETS | | | | | |
| Current Assets | 402 326 | 590 913 | 669 224 | 553 983 | 373 511 |
| Cash and cash equivalents | 245 936 | 442 827 | 516 096 | 395 506 | 207 902 |
| Receivables | 132 015 | 131 013 | 136 909 | 143 069 | 149 508 |
| Inventories | 24 376 | 17 073 | 16 219 | 15 408 | 16 102 |
| Non-current Assets | 1 762 632 | 1 921 331 | 2 009 517 | 2 091 948 | 2 192 340 |
| Investment property | 3 093 | 5 000 | 5 000 | 5 000 | 5 000 |
| Property, plant and equipment | 1 742 739 | 1 896 747 | 1 984 061 | 2 059 197 | 2 157 369 |
| Intangible assets | 16 578 | 19 362 | 20 233 | 27 528 | 29 748 |
| Heritage assets | 223 | 223 | 223 | 223 | 223 |
| Total Assets | 2 164 958 | 2 512 244 | 2 678 740 | 2 645 931 | 2 565 851 |
| LIABILITIES | | | | | |
| Current Liabilities | 314 423 | 373 651 | 349 571 | 327 265 | 356 073 |
| Payables | 314 423 | 373 651 | 349 571 | 327 265 | 356 073 |
| Provisions | - | - | - | - | - |
| Non-current Liabilities | 248 563 | 384 227 | 448 013 | 329 658 | 151 772 |
| Employee benefits | 10 570 | 16 486 | 17 228 | 18 003 | 18 813 |
| Deferred Income: Revenue Grants | 237 993 | 367 742 | 430 786 | 311 655 | 132 959 |
| Total Liabilities | 562 985 | 757 878 | 797 585 | 656 923 | 507 844 |
| Net Assets | 1 601 973 | 1 754 366 | 1 881 156 | 1 989 009 | 2 058 007 |
| Capital Fund | 647 153 | 647 153 | 647 153 | 647 153 | 647 153 |
| Insurance Reserve | 6 304 | 6 304 | 6 304 | 6 304 | 6 304 |
| Accumulated Surplus/(Loss) | 948 515 | 1 100 908 | 1 227 698 | 1 335 551 | 1 404 550 |
| Total Net Assets | 1 601 973 | 1 754 366 | 1 881 156 | 1 989 009 | 2 058 007 |

| Cash Flow Statement | | | | | |
|---|------------------------|-------------------------|-------------------------|--------------------|--------------------|
| | Audited 2019/20 | Forecast 2020/21 | Budgeted 2021/22 | 2022/23 | 2023/24 |
| | R'000 | R'000 | R'000 | R'000 | R'000 |
| Receipts | 1 509 891 | 1 461 372 | 1 485 398 | 1 384 389 | 1 397 550 |
| Sales of goods and services | 400 134 | 366 711 | 353 010 | 339 937 | 355 234 |
| Grants | 1 090 178 | 1 084 088 | 1 115 332 | 1 034 191 | 1 036 136 |
| Interest received | 19 442 | 10 421 | 16 944 | 10 167 | 6 100 |
| Dividend received | 137 | 152 | 111 | 94 | 80 |
| Payments | (1 251 543) | (1 152 854) | (1 246 286) | (1 266 064) | (1 286 733) |
| Employee Costs | (787 753) | (698 514) | (806 767) | (806 767) | (806 767) |
| Suppliers | (463 570) | (454 189) | (439 513) | (459 292) | (479 960) |
| Interest Paid | (220) | (152) | (5) | (5) | (6) |
| Net Cash flows from operating activities | 258 348 | 308 517 | 239 112 | 118 325 | 110 818 |
| Purchases of property, plant and equipment | (91 076) | (111 626) | (165 843) | (238 916) | (298 421) |
| Proceeds from sale of properties and equipment | 2 315 | 0 | 0 | 0 | 0 |
| Net Cash flows from investing activities | (88 761) | (111 626) | (165 843) | (238 916) | (298 421) |
| Net increase(decrease) in cash and cash equivalents | 169 587 | 196 891 | 73 269 | (120 590) | (187 604) |
| Cash and cash equivalents at the beginning of the period | 76 348 | 245 936 | 442 827 | 516 096 | 395 506 |
| Cash and cash equivalents at the end of the period | 245 936 | 442 827 | 516 096 | 395 506 | 207 902 |

Human Resources

| DIVISION | ADMINISTRATION & SUPPORT |
|------------------------|--------------------------|
| Human Resources | 44 |
| Finance | 41 |
| ICT and Infrastructure | 46 |

7. MATERIALITY FRAMEWORK

For the purposes of materiality defined in sections 50(1), 55(2) and 66(1) of the Public Finance Management Act³³, the ARC has developed and agreed upon a framework of acceptable levels of materiality and significance with the relevant Executive Authority.

ARC MATERIALITY AND SIGNIFICANCE FRAMEWORK

| PFMA SECTION | QUANTITATIVE (AMOUNT) | QUANTITATIVE (NATURE) |
|--|--|--|
| Section 50 Fiduciary duties of accounting authorities | | |
| (1) The accounting authority for a public entity must –(c) on request, disclose to the executive authority responsible for that public entity or other legislature to which the public entity is accountable, all material facts, including those reasonably discoverable, which in any way may influence the decisions or actions of the executive authority or that legislature. | Any fact discovered of which the amount exceeds the materiality figure (R10 million) used in the preparation of the Annual Financial Statements. | 1. Any item or event of which specific disclosure is required by legislation/law, King Report IV or GRAP. 2. Any fact discovered of which its omission or misstatement, in the Council's opinion, could influence the decisions or actions of the executive authority or legislature. |
| Section 55 Annual Report and financial statements | | |
| (2) The annual report and financial Statements referred to in subsection (1)(d) must- a) fairly present the state of affairs of the public entity, its business, its financial results, its performance against pre-determined objectives and its financial position as the end of the financial year concerned; b) include particulars of: | - | - |
| i. any material losses through criminal conduct and any irregular expenditure and fruitless and wasteful expenditure that occurred during the financial year. | 1. Losses through criminal conduct – any loss identified. 2. Losses through any expenditure - if the combined total exceeds the materiality figure used in the preparation of the Annual Financial Statements. 3. Any irregular, fruitless, and wasteful expenditure, defined by the PFMA, will be reported. | Any identified loss through criminal, reckless, or negligent conduct. |

³³ Available: <http://www.treasury.gov.za/legislation/PFMA/act.pdf>

| PFMA SECTION | QUANTITATIVE (AMOUNT) | QUANTITATIVE (NATURE) |
|---|---|--|
| ii. any criminal or disciplinary steps taken as consequence of such losses or irregular expenditure or fruitless and wasteful expenditure; iii. any losses recovered or written off; iv. any financial assistance received from the state and commitments made by the state on its behalf; and v. any other matters that may be prescribed. | - | - |
| Section 54 Information to be submitted by accounting authorities | | |
| (2) Before a public entity concludes any of the following transactions, the accounting authority for the public entity must promptly and in writing inform the relevant treasury of the transaction and submit relevant particulars of the transaction to its executive authority for approval of the transaction: | | |
| (b) participation in a significant partnership, trust, unincorporated joint venture or similar arrangement; | Not applicable | Any participation, outside of the approved strategic plan and budget. |
| (c) acquisition or disposal of a significant shareholding in a company; (d) acquisition or disposal of a significant asset; and | Acquisition: More than R48 mil Disposal: Movable Assets the combined value of which exceeds R48 million. | Any acquisition or disposal, outside of the approved strategic plan and budget 1) Any asset that would increase or decrease the overall operation functions of the Council, outside of the approved strategic plan and budget. 2) Disposal of the major part of the assets of the Council. |
| e) commencement or cessation of significant business activity. | Not applicable | Any business activity that would increase or decrease the overall operational functions of the Council, outside of the approved strategic plan and budget. |
| Section 66 Restrictions on borrowing, guarantees and other commitments | | |
| (1) An institution to which this Act applies may not borrow money or issue a guarantee, indemnity or security, or enter into any other transaction that binds or may bind that institution or the Revenue fund to any future financial commitment, unless such borrowing, guarantee, indemnity, security or other transaction – (a) Is authorised by this Act, and In the case of public entities, is also authorised by other legislation not in conflict with this Act. | All borrowings contemplated by the Agricultural Research Council, has to be pre-authorised by the National Treasury regardless of the amount. | All borrowings contemplated by the Agricultural Research Council, has to be pre-authorised by the National Treasury regardless of the nature. |

The Significance and Materiality calculation is based on the FY2021/22 budgeted figures and on the following parameters:

| BASIS | ACCEPTABLE % RANGE | MINIMUM | MAXIMUM |
|------------------|--------------------|------------|------------|
| Total Revenue | 0.5% – 1% | 7 427 388 | 14 854 776 |
| Profit after tax | 2% - 5% | 407 151 | 1 017 878 |
| Total assets | 1% - 2% | 26 534 008 | 53 068 016 |

8. UPDATED KEY RISKS

Aligned to the strategic outcomes of the ARC, the following top ten strategic risks have been developed, assessed, and ranked. Internal controls and actions to mitigate these risks will be formulated by management, with a view to improving the chances of the organisation meeting its commitments in the 2021/22 reporting period.

The detailed Agricultural Research Council Risk Register shall be reviewed and monitored quarterly before it is presented at the EMC and the Audit and Risk Committee meetings.

TOP 10 STRATEGIC RISK EXPOSURES

| RANKING | STRATEGIC RISK EXPOSURES |
|---------|---|
| 1 | Negative impact of the Coronavirus on ARC business across respective Campuses |
| 2 | Funding constraints to fully meet the ARC's mandate, which incorporates aspects of: <ul style="list-style-type: none"> • Dwindling PG allocation (impact on human resources, in-sourcing and research outputs) • Lack of National Assets funding • Inability to generate adequate external income (e.g. coordinated revenue generated approach) • Funding from commodity organisations at risk (i.e. withdrawn / not continuing) |
| 3 | Inability to deliver FMD vaccines in 2021/22 FY due to delays in the construction of the FMD Vaccine Facility |
| 4 | Ageing and obsolete equipment and infrastructure across the ARC which may lead to a compromised R&D output and reduce our competitive advantage in the sector |
| 5 | Long turn-around times in respect of ARC business processes that are caused by delays in: <ul style="list-style-type: none"> • SCM process (e.g. Long outstanding Open Purchase Orders, turn-around times, ERP system improvements i.r.o good received, supplier registration - portal) • Conclusion of contracts (lengthy approval processes) • IP management process • Recruitment process • Inability of managers to make decisions |
| 6 | Sub-optimal leveraging of ARC assets, property and facilities, as outlined in the Asset Management Plan |
| 7 | Challenges with respect to: <ul style="list-style-type: none"> • Recruitment and retention of suitably qualified and experienced personnel in critical and scarce skill areas • Succession planning • Loss of high level qualified and experienced personnel • Inability to replace essential support staff. |
| 8 | Infringement of ARC IP |
| 9 | Loss of credibility and revenue as a result of a unstandardised quality management system for ARC laboratories providing services |
| 10 | Non-compliance to key legislation: <ul style="list-style-type: none"> • Insufficient centralised process to coordinate legislative compliance, across the organisation. • Environmental compliance as per assessment |

9. PUBLIC ENTITIES

The Agricultural Research Council does not have any Public Entities.

10. INFRASTRUCTURE PROJECTS

FOOT AND MOUTH DISEASE (FMD) VACCINE PRODUCTION FACILITY

Due to a variety of reasons, South Africa's only Foot and Mouth Disease (FMD) vaccine production facility at the ARC Onderstepoort Campus ceased functioning in December 2005. Lack of FMD vaccine production at this strategic national facility has increased the risk for the effective management of potential disease outbreaks. In the interim, South Africa has relied on procurement of vaccine from the Botswana Vaccine Institute (BVI). Foot-and-Mouth disease ("FMD") is listed as a controlled disease in South Africa in terms of the Animal Disease Act 35 of 1984³⁴. FMD is a highly contagious and acute viral affliction of domestic and wild cloven-hoofed animals. The cost of FMD is based on the stringent control measures needed to contain this highly infectious disease and the impact on production the disease has. The direct losses incurred due to an outbreak of the disease include the capital value of herds should culling processes be implemented as part of the control programme, loss of production and associated income and an increase in production costs as a result of additional on-farm quarantine restrictions. However, by far the greatest costs associated with FMD are the trade restrictions placed on an area with a confirmed outbreak, where the impact can go far beyond the livestock industry traditionally linked with FMD. Most recent estimates of the total loss in export revenue, including losses incurred by upstream and downstream sectors linked to livestock production, exceed R6.4 billion measured against the 2016 red meat export value.

To mitigate the risk, the ARC developed a Business Plan outlining its intentions to construct a new state-of-the-art FMD vaccine production facility. The business plan was presented to National Treasury on 01 March 2010, outlining the ARC's economic and business cases in terms of the National Treasury guidelines entitled: "2010 MTEF: Budgeting for Infrastructure and Capital Expenditure Guidelines". The document was endorsed by the Minister of Agriculture and funded by the National Treasury over the 2011/2012 financial year. In April 2019, the National Treasury allocated the shortfall of R 400 million of additional funding to the ARC in support of the FMD vaccine factory. The funds will be released over the current MTEF. This will allow the ARC to proceed with the construction of the facility.

For the project to be properly implemented and brought to its conclusion, the following processes have to be implemented:

- i. Construction related firms such as engineering, architectural, electrical, mechanical and construction to design plan and implement the construction of the new FMD factory will be contracted. A Project Manager to manage the construction has already been recruited. To comply with applicable legislation and regulations the ARC has to proceed with an open process to invite bids for the project from prospective construction and engineering service providers, which, because of the amounts involved, have to be approved by the Board
- ii. A process engineer or expert to develop the design or layout of the infrastructure (piping, bioreactors, purifiers, centrifuges, etc.) that will be used in the manufacturing process must be appointed. A well designed production process is essential for optimisation of the factory design, particularly for obtaining qualifications for good

³⁴ Available: <https://www.gov.za/documents/animal-diseases-act-12-mar-2015-1128#>

- manufacturing practice (GMP) which is required not only for export purposes but also by the South African Medicines Control Council to grant the manufacturing license for the factory.
- iii. Obtain all the regulatory permits and approvals for the construction of the facility. These can be secured by the firm that get the contract to project manage the construction phase of the project.
 - iv. Start the construction phase of the factory. The building must have engineering features to ensure that the highest international standards are achieved and that a world-leading environment for both staff and animals is delivered.

The development of a modern FMD production facility would be an international showcase of SA's capabilities and foresight and the expected period to produce the first validated vaccines is:

| PHASE | ACTIVITIES |
|---|--|
| Design phase (12 months – 2021/2022) | Appointment of process engineer Appointment of company with multidisciplinary team. Conduct an Environmental Impact Assessment (EIA) Design the process and plant layout Comply with municipal regulations and by-laws Comply with Health regulations (Act 36 ³⁵) Design the building with detail drawings Draw up the bill of quantities |
| Construction (24 months) | Ordering of specialised equipment Construction of building according to specifications Issue of certificates of completion (civil, electrical, fire, health, etc.) Commissioning |
| Validation (18 months) | Foot and mouth disease vaccine trials Inspection |
| Full commercial Production | The first commercially available vaccines will only be available in 4.5 to 5 years from the start of the process. |

As this is a specialised building, highly skilled external consulting engineers and other specialists will need to be appointed to develop a concept layout and detailed design of the manufacturing process. They will consult with the Process Engineer and the Vaccine production team in preparation for the construction of the new facility, with accurate user specification requirements, detailed design diagrams, and cost estimates. A full-scale production facility could cost in the order of R600 000 000 - R700 000 000 (excluding VAT).

³⁵ Fertilizers, Farm Feeds, Seeds and Remedies Act 36 of 1947. Available: <https://www.gov.za/documents/fertilizers-farm-feeds-seeds-and-remedies-act-28-may-2015-1101>

ARC COMMERCIAL ENTITY

Commercialisation in terms of the IPR Act³⁶ and AR Act:

The IPR Act 51 of 2008 objectives provides that IP generate from public fund must be identified, protected, utilised and commercialised for the benefit of the Republic.

a) Agricultural Research Act 86 of 190³⁷ states:

Section 4(1)(m)(iii): In order to achieve its objects, the ARC may - With the approval of the Minister, acting with the concurrence of the Minister of Finance - on its own, or in association with any person, establish a company for the purpose of developing or exploiting in any manner any invention or technological expertise, and for this purpose acquire an interest in or control over company or statutory body referred to in section of the Exchequer Act, 1975³⁸;

Section 4(1)(o)(i): In order to achieve its objects, the ARC may - As an end-product of research, development and technology transfer undertaken or caused to be undertaken by the ARC;

- produce and sell reports, computer programmes and other intellectual property
- manufacture and sell instruments, equipment and similar items
- produce, process and sell products
- conduct or commission market research and sell the results thereof; and
- provide, against payment, services not directly related to research.

Section 4(1)(q)(i), In order to achieve its objects, the ARC may - Do everything which in the opinion of the Council is conducive to the achievement of its objects or is calculated, directly or indirectly, to enhance or render profitable the value of the property or rights of the ARC.

b) National Intellectual Property Management Office's Framework for Office of Technology Transfer³⁹

NIPMO has developed a framework that the Science Councils and the High Education Institutes can use to the OTT and the commercialisation. In line with Vision 2050, the ARC wants to fully commercialise the products, services, and non-technologies. Over the past 10 years when the ARC IP Policy was approved the ARC have only followed licensing as the way of commercialisation. The ARC is now improving that by considering other ways of commercialisation that will result in better income generation. In order to improve the income generated, the ARC will explore commercialisation through ARC Commercialisation entity. The NIPMO OTT framework and the AR Act⁴⁰ Section 4 support the Entity, which will allow consolidation of all commercialisation activities.

The ARC will be expected to invest in the ARC Commercialisation entity and the financial implications will be determined in the commercialisation strategy during the 2021/22 FY.

³⁶ Intellectual Property Rights from Publicly Financed Research and Development Act 51 of 2008. Available:

<https://www.gov.za/documents/intellectual-property-rights-publicly-financed-research-and-development-act-regulations-1>

³⁷ Available: <https://www.arc.agric.za/Documents/Agricultural%20Research%20Act%20%2086%20of%201990.pdf>

³⁸ Available: [https://www.gov.za/documents/exchequer-and-audit-act-19-may-2015-1025#:~:text=Exchequer%20Act%20\(previously%20Exchequer%20and%20Audit%20Act\)%2066%20of%201975,-Files%203A&text=The%20Exchequer%20Act%20\(previously%20Exchequer,to%20provide%20for%203A&text=the%20appointment%20of%20an%20Auditor,certain%20accounts%20by%20him%203B%20and](https://www.gov.za/documents/exchequer-and-audit-act-19-may-2015-1025#:~:text=Exchequer%20Act%20(previously%20Exchequer%20and%20Audit%20Act)%2066%20of%201975,-Files%203A&text=The%20Exchequer%20Act%20(previously%20Exchequer,to%20provide%20for%203A&text=the%20appointment%20of%20an%20Auditor,certain%20accounts%20by%20him%203B%20and)

[1025#:~:text=Exchequer%20Act%20\(previously%20Exchequer%20and%20Audit%20Act\)%2066%20of%201975,-Files%203A&text=The%20Exchequer%20Act%20\(previously%20Exchequer,to%20provide%20for%203A&text=the%20appointment%20of%20an%20Auditor,certain%20accounts%20by%20him%203B%20and](https://www.gov.za/documents/exchequer-and-audit-act-19-may-2015-1025#:~:text=Exchequer%20Act%20(previously%20Exchequer%20and%20Audit%20Act)%2066%20of%201975,-Files%203A&text=The%20Exchequer%20Act%20(previously%20Exchequer,to%20provide%20for%203A&text=the%20appointment%20of%20an%20Auditor,certain%20accounts%20by%20him%203B%20and)

³⁹ Available: https://nipmo.dst.gov.za/uploads/files/140127_LNIP01_OTT-Framework_REV05.pdf

⁴⁰ Available: <https://www.arc.agric.za/Documents/Agricultural%20Research%20Act%20%2086%20of%201990.pdf>

ICT RELATED PROJECTS

The Datacentre and Disaster Recovery site of the ARC provides critical services to the ARC in as far as the capability to host critical applications, software and to ensure that critical information and data assets generated by the ARC is safeguarded. In 2012, ARC decided to upgrade the old storage HP hardware in its Data Centres to accommodate the deployment of modern applications and systems such as Microsoft operating system, SharePoint, Exchange, Active directory, Lync, Microsoft Dynamics and MS SQL. However, over the years, the infrastructure in these environments has become insufficient and outdated to handle growing information and data needs of the ARC. In addition, there are various issues identified that exposes the ARC to risks associated with business continuity and ability to remain competitive as a research institution. These includes amongst others:

- The current disaster recovery (DR) is non-functional due to the limitations on connectivity and the hardware equipment
- Most of the hardware used by the ARC has reached end of life (Obsolete)
- The ARC is running two infrastructure platforms (i.e. Hyper-V and VMware) and thus making operations of the data centre costly
- There is not enough storage to accommodate for a fully flashed DR and Production Environment
- Some of the equipment are not covered by the support contract nor warranty, which present a huge risk to the business (i.e. equipment for the Intergis systems)
- The current data centre environment is not build in line with the best practices, which renders the ICT department vulnerable to provide business continuity in case of disaster
- The current aging infrastructure prohibit the ICT department to cope with the current and growing business needs as the ICT infrastructure is not scalable
- The current backup capacity is inadequate; and as a result, the backup turnaround time is prolonged and poses risk to the business

ICT decided to embark on process to refresh the ICT Infrastructure to mitigate the above issues. The ICT Infrastructure refresh process will benefit ARC in the following way:

- Increase overall productivity by providing the appropriate platform to handle Corporate Applications (i.e. ERP solutions, SharePoint, Email and Intergis)
- Reduce costs for provisioning and supporting services
- Provide for a better customer experience
- Minimise the organisational risk of running end-of-life hardware
- Improve ARC capability to deal with risk associated with business continuity and information security

ICT is therefore expecting to complete project implementation by 2021/2022, which will be followed by post-implementation support. The timeline of this project is outlined as follows:

| Milestones | 2020/21 | | | | 2021/22 | | | | 2022/23 | | | | 2023/24 | | | | 2023/24 | | | |
|--------------------------------|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Procurement Submission | | | | | | | | | | | | | | | | | | | | |
| Tender Publication | | | | | | | | | | | | | | | | | | | | |
| Tender Evaluation | | | | | | | | | | | | | | | | | | | | |
| Tender approval | | | | | | | | | | | | | | | | | | | | |
| Tender Award & Contracting | | | | | | | | | | | | | | | | | | | | |
| Project Planning | | | | | | | | | | | | | | | | | | | | |
| Implementation | | | | | | | | | | | | | | | | | | | | |
| Project Close Out | | | | | | | | | | | | | | | | | | | | |
| Service Level Agreement Year 1 | | | | | | | | | | | | | | | | | | | | |
| Service Level Agreement Year 2 | | | | | | | | | | | | | | | | | | | | |
| Service Level Agreement Year 3 | | | | | | | | | | | | | | | | | | | | |

The expected budget for this processes estimated at R25 million and the expenditure would be spread over 3 years.

11. PUBLIC / PRIVATE PARTNERSHIPS

Not applicable to the Agricultural Research Council at this stage.

PART D: TECHNICAL INDICATOR DESCRIPTIONS

OUTCOME 1: INCREASED AGRICULTURAL PRODUCTION AND PRODUCTIVITY

| | |
|---|---|
| Output | Crop technologies developed and information dissemination |
| Output Indicator 1.1.1 | Number of cultivars registered |
| Definition | Makes reference to the number of plant cultivars registered by DALRRD Registrar, as per the Plant Breeders Rights Act and variety listings. This includes ARC cultivars that are registered globally as per international standards. A cultivar refers to a plant variety that has been produced in cultivation by breeding |
| Source of data | Certificate of Plant Breeders Right and/or signed letter for notifications of granting of varietal listings issued to the ARC |
| Method of Calculation / Assessment | Simple count of the Plant Breeders Right certificates and/or signed letter for notifications of granting of varietal listings issued to the ARC |
| Means of verification | Plant Breeders Right certificates and/or signed letter for notifications of granting of varietal listings issued to the ARC |
| Assumptions | The adoption of ARC cultivars depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

| | |
|---|--|
| Output | Crop technologies developed and information dissemination |
| Output Indicator 1.1.2 | Number of field trials |
| Definition | The ARC undertakes various R&D field trials in order to, amongst others; determine the yield potential under certain farming environments/conditions on various farms across South Africa. Field trials occur when the ARC plant cultivars to conduct and undertake research trials to determine the yield and nutritional potential among other things the climatic requirements under certain farming environments/conditions on various farms across South Africa |
| Source of data | All Global Positioning System (GPS) coordinates and/or a technical report (1 per site) for each of the field trials attributed to ARC. Difference in the form of verifiable evidence such as dates and time, type of variety, etc. is required for trials that have similar GPS coordinates but different trials |
| Method of Calculation / Assessment | Simple count of all GPS coordinates reflecting the exact location or number of reports of field trials attributed to ARC with verifiable evidence such as dates and time, type of variety for trials that have similar GPS coordinates but different trials |
| Means of verification | Global Positioning System (GPS) coordinates for each trial/s or a technical report with verifiable evidence such as dates and time, type of variety, photos etc. for trials that have similar GPS coordinates but different trials |
| Assumptions | The planting of ARC cultivars depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: RIS |

| | |
|-------------------------------|---|
| Output | Crop technologies developed and information dissemination |
| Output Indicator 1.1.3 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture commodity application, intended for distribution and use by farmers, extensions officers, commodity groups/organisations, and other interested parties. The ARC employees writes various research output report for distribution to |

ARC: Annual Performance Plan 2021/22

| | |
|---|---|
| | stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports and/ or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: RIS |

| | |
|---|---|
| Output | Crop technologies developed and information dissemination |
| Output Indicator 1.1.4 | Number of cultivar evaluations |
| Definition | Evaluation of how different commercial cultivars perform in different agro-ecological zones |
| Source of data | Technical reports, ARC websites and Grain SA magazine including other commodity-based magazines such as CHIPS, Fruit-SA, Red Meat Producers Organisation, NuFarmer, Farmers weekly, SA Fruit Journal, Harvest SA, AgriAbout, Farmbiz (AgriOrbit), Agriring Bulletin, SAPPA, IWYP, SAMAC, SAAGA |
| Method of Calculation / Assessment | Number of crop/s cultivar evaluations for which ARC conducts national cultivar trials |
| Means of verification | Technical reports, ARC websites and or Grain SA magazine including other commodity based magazines such as CHIPS, Fruit-SA, Red Meat Producers Organisation, NuFarmer, Farmers weekly, SA Fruit Journal, Harvest SA, AgriAbout, Farmbiz (AgriOrbit), Agriring Bulletin, SAPPA, IWYP, SAMAC, SAAGA |
| Assumptions | Commercial cultivars are submitted by different seed companies for evaluation |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

| | |
|---|--|
| Output | Animal improvement services |
| Output Indicator 1.2.1 | Number of farmers participating in each of the animal improvement schemes |
| Definition | The ARC is the custodian of the National Animal Recording and Improvement Schemes (NARIS) for beef, dairy and smallstock, which aims to provide the livestock industry with professional and internationally recognised recording and genetic improvement services |
| Source of data | All farmers participating in NARIS, as captured in INTERGIS |
| Method of Calculation / Assessment | Simple count of all livestock farmers (beef, dairy, smallstock), participating in National Animal Improvement Scheme (dairy, beef and smallstock, e.g. Phase A, B, C, etc.) as captured in INTERGIS. |
| Means of verification | NARIS, as captured in INTERGIS report |
| Assumptions | The availability of farmers to register and participate in the improvement schemes and associated funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

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| Output | Animal improvement services |
| Output Indicator 1.2.2 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture commodity application, intended for distribution and use by farmers, extensions officers, commodity groups/organisations and other interested parties. The ARC employees writes various research outputs report for distribution to |

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| | stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports and/or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial, and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

OUTCOME 2: SUSTAINABLE ECOSYSTEMS AND NATURAL RESOURCES

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| Output | Natural Resource Management |
| Output Indicator 2.1.1 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture sustainability ecosystems and natural resources status intended for distribution and use by farmers, extensions officers, commodity groups/organisations, and other interested parties. The ARC employees writes various research output report for distribution to stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports developed and/or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial, and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|------------------------------------|--|
| Output | Natural Resource Management |
| Output Indicator 2.1.2 | Number of field trials |
| Definition | The ARC undertakes various R&D field trials, in order to support agriculture production for optimal conservation and utilisation of natural resources. Field trials occur when the ARC plant cultivars to conduct and undertake research trials to determine the yield and nutritional potential among other things the climatic requirements under certain farming environments/conditions on various farms across South Africa |
| Source of data | All Global Positioning System (GPS) coordinates and/or a technical report (1 per site) for each of the field trials attributed to ARC. Difference in the form of verifiable evidence such as dates and time, type of variety etc. is required for trials that have similar GPS coordinates but different trials |
| Method of Calculation / Assessment | Simple count of all GPS coordinates reflecting the exact location or number of reports of field trials attributed to ARC with verifiable evidence such as dates and time, type of variety for trials that have similar GPS coordinates but different trials |
| Means of verification | Global Positioning System (GPS) coordinates for each trial/s or a technical report with verifiable evidence such as dates and time, type of variety, photos etc. for trials that have similar GPS coordinates but different trials |

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| Assumptions | The planting of ARC cultivars depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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| Output | Natural Resource Management |
| Output Indicator 2.1.3 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered relating to natural resources management |
| Source of data | All invoices and/or job card numbers issued in respect of scientific services relating to natural resources management, i.e. diagnostic and analytical services, consultation services, rendered per batch of samples. The invoices and/or job card number vary across campuses. For some campuses, a general release permit is applicable |
| Method of Calculation / Assessment | Simple count of all invoices and/or job card numbers as well as general release permits correlating to scientific services rendered, i.e. diagnostic and analytical, consultations |
| Means of verification | All invoices and/or job card numbers issued in respect of scientific services relating to natural resources management, i.e. diagnostic and analytical, consultation services rendered including a report and or invoice of consultations services |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: RIS |

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| Output | Natural Resource Management |
| Output Indicator 2.1.4 | Number of biological control solutions developed |
| Definition | Pest control products developed based on biological organisms |
| Source of data | Registration under the Fertilizers, Farm Feeds, Seeds and Remedies Act 36 of 1947 ⁴¹ (L number) |
| Method of Calculation / Assessment | Counting the number of applications for registrations submitted |
| Means of verification | Acknowledgment of receipt of applications for Registration of product under the Fertilizers, Farm Feeds, Seeds and Remedies Act 36 of 1947 |
| Assumptions | Availability of resources from the Registrar to complete the evaluation process |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|---|
| Output | Soil and Water Science |
| Output Indicator 2.2.1 | Number of samples analysed for soil health and/or water quality |
| Definition | This refers to investigation of the presence of organisms in soil and plant material samples and water quality. Including number of samples and water quality analysis for the presence, absence, diversity, frequency, and/or distribution of target organisms in soil, plant material and water |
| Source of data | Client report of results indicating the number samples (soil, plant material and water) analysed |
| Method of Calculation / Assessment | Counting of number of reports of results of sample analysed. Each batch with number of samples per separate report. Counting the number of samples (soil, plant material, or water) submitted for various analyses as captured in the Client Report |
| Means of verification | Client report containing results of samples (soil, plant material, and water) analysed |

⁴¹ Available: <https://www.gov.za/documents/fertilizers-farm-feeds-seeds-and-remedies-act-28-may-2015-1101#>

ARC: Annual Performance Plan 2021/22

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| Assumptions | The ability of participants to request/demand services from the ARC |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: Animal Sciences |

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| Output | Soil and Water Science |
| Output Indicator 2.2.2 | Number of scientific solutions |
| Definition | This refers to new solutions developed with the aim to commercialise. Including research products, services and processes aimed at solving problems faced by stakeholders within the sector such as farmers, commodity organisations, general public, etc. |
| Source of data | Registration number allocated by the registrar |
| Method of Calculation / Assessment | Counting number of solutions developed |
| Means of verification | Report in the form of certificate or other means such as a letter that is applicable to the registration authority |
| Assumptions | Quick turnaround time with respect to registration of solutions |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|--|
| Output | Soil and Water Science |
| Output Indicator 2.2.3 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture sustainability ecosystems and natural resources status, intended for distribution and use by farmers, extensions officers, commodity groups/organisations, and other interested parties. The ARC employees writes various research output report for distribution to stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports and/or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: RIS Group Executive: Animal Sciences |

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| Output | Soil and Water Science |
| Output Indicator 2.2.4 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered relating to soil and water science |
| Source of data | Report and/or invoice and/or job card numbers per each sample analysed and/or services rendered (submitted) for clients relating to soil and water science. The invoices and/or job card varies across campuses. For some campuses, a general release permit is applicable |
| Method of Calculation / Assessment | Counting number of reports and/or invoice and/or job card numbers per each samples analysed and/or services rendered as per request by clients |

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| Means of verification | Report and/or invoice and/or job card numbers per each number of samples analysed and/or services rendered as per request by clients including a report and/or invoice of consultations services relating to soil and water science |
| Assumptions | Functional infrastructure and equipment |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year to Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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| Output | Weed Science |
| Output Indicator 2.3.1 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture sustainability ecosystems and natural resources status, intended for distribution and use by farmers, extensions officers, commodity groups/organisations, and other interested parties. The ARC employees writes various research output report for distribution to stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports and/or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|---|
| Output | Weed Science |
| Output Indicator 2.3.2 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered relating to weed science |
| Source of data | Technical/client reports developed and/or invoice issued and/or job card numbers and/or general release permit relating to weed science |
| Method of Calculation / Assessment | Simple count of the technical/client reports developed and/or invoice issued and/or job card numbers and/or general released applications approved by DALRRD |
| Means of verification | Technical/client reports developed and/or invoice issued and/or job card numbers and/or general release permit including a report and/or invoice of consultations services relating to weed science |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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| Output | Ecosystem Services |
| Output Indicator 2.4.1 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture sustainability ecosystems and natural resources status, intended for distribution and use by farmers, extensions officers, commodity groups/organisations, and other interested parties. The ARC employees writes various research output report for distribution to stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. |

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| | This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports and/or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: RIS |

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|---|--|
| Output | Ecosystem Services |
| Output Indicator 2.4.2 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered relating to ecosystem services |
| Source of data | Report and/or invoice and/or job card numbers per each sample analysed and/or services rendered (submitted) for clients relating to ecosystem services. The invoices and/or job card varies across campuses. For some campuses, a general release permit is applicable |
| Method of Calculation / Assessment | Counting number of reports and/or invoice and/or job card numbers per each samples analysed and/or services rendered as per request by clients |
| Means of verification | Report and/or invoice and/or job card numbers per each number of samples analysed and/or services rendered as per request by clients including a report and/or invoice of consultations services relating to ecosystem services |
| Assumptions | Functional infrastructure and equipment |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year to Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: RIS |

OUTCOME 3: IMPROVED NUTRITIONAL VALUE, QUALITY AND SAFETY OF AGRICULTURAL PRODUCTS

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| Output | Broadening the food base |
| Output Indicator 3.1.1 | Number of cultivars registered |
| Definition | Makes reference to the number of plant cultivars registered by DALRRD Registrar, as per the Plant Breeders Rights Act and variety listing for canned peaches, dried fruit and orange-fleshed sweet potato. A cultivar refers to a plant variety that has been produced in cultivation by breeding |
| Source of data | Certificate of Plant Breeder's Right and/or signed letter for notifications of granting of varietal listings issued to the ARC |
| Method of Calculation / Assessment | Simple count of the Plant Breeders Right certificates and/or signed letter for notifications of granting of varietal listing issued to the ARC |
| Means of verification | Plant Breeders Right certificates and/or signed letter for notifications of granting of varietal listing issued to the ARC |
| Assumptions | The adoption of ARC cultivars depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |

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|---|--|
| Indicator Responsibility | Group Executive: Crop Sciences |
| Output | Broadening the food base |
| Output Indicator 3.1.2 | Number of field trials |
| Definition | The ARC undertakes various R&D field trials in order to, amongst others; determine the yield potential under certain farming environments/conditions on various farms across South Africa. Field trials occur when the ARC plant cultivars to conduct and undertake research trials to determine the yield and nutritional potential among other things the climatic requirements under certain farming environments/conditions on various farms across South Africa |
| Source of data | All Global Positioning System (GPS) coordinates and/or a technical report (1 per site) for each of the field trials attributed to ARC. Difference in the form of verifiable evidence such as dates and time, type of variety etc. is required for trials that have similar GPS coordinates but different trials |
| Method of Calculation / Assessment | Simple count of all GPS coordinates reflecting the exact location or number of reports of field trials attributed to ARC with verifiable evidence such as dates and time, type of variety for trials that have similar GPS coordinates but different trials |
| Means of verification | Global Positioning System (GPS) coordinates for each trial/s or a technical report with verifiable evidence such as dates and time, type of variety, photos etc. for trials that have similar GPS coordinates but different trials |
| Assumptions | The planting of ARC cultivars depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|--|
| Output | Broadening the food base |
| Output Indicator 3.1.3 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture commodity application, intended for distribution and use by farmers, extensions officers, commodity groups/organisations, and other interested parties. The ARC employees writes various research outputs report for distribution to stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports and/or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|--|
| Output | Broadening the food base |
| Output Indicator 3.1.4 | Number of cultivar evaluations |
| Definition | Evaluation of how different commercial cultivars perform in different agro-ecological zones for improved nutritional value |
| Source of data | Technical reports, ARC websites and Grain SA magazine such as CHIPS, Fruit-SA, Red Meat Producers Organisation, NuFarmer, Farmers weekly, SA Fruit Journal, Harvest SA, AgriAbout, Farmbiz (AgriOrbit), Agriring Bulletin, SAPPA, IWYP, SAMAC, SAAGA |
| Method of Calculation / Assessment | Number of crops for which ARC conducts national cultivar trials |

ARC: Annual Performance Plan 2021/22

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| Means of verification | Technical reports, ARC websites and Grain SA magazine including other commodity based magazines such as CHIPS, Fruit-SA, Red Meat Producers Organisation, NuFarmer, Farmers weekly, SA Fruit Journal, Harvest SA, AgriAbout, Farmbiz (AgriOrbit), Agriling Bulletin, SAPPA, IWYP, SAMAC, SAAGA |
| Assumptions | Commercial cultivars are submitted by different seed companies for evaluation |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|--|
| Output | Broadening the food base |
| Output Indicator 3.1.5 | Number of new products developed |
| Definition | This refers to new products developed for the sector and farming communities |
| Source of data | Report of new product developed |
| Method of Calculation / Assessment | Counting of reports |
| Means of verification | Report of new product developed |
| Assumptions | Functional infrastructure and equipment |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|--|
| Output | Broadening the food base |
| Output Indicator 3.1.6 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered relating to broadening the food base |
| Source of data | Report and/or invoice and/or job card numbers per each sample analysed and/or services rendered (submitted) for clients relating to broadening the food base. The invoices and/or job card varies across campuses. For some campuses, a general release permit is applicable |
| Method of Calculation / Assessment | Counting number of reports and/or invoice and/or job card numbers per each samples analysed and/or services rendered as per request by clients |
| Means of verification | Report and/or invoice and/or job card numbers per each number of samples analysed and/or services rendered as per request by clients including a report and/or invoice of consultations services relating to broadening the food base |
| Assumptions | Functional infrastructure and equipment |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences |

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| Output | Post-harvest handling and agro-processing |
| Output Indicator 3.2.1 | Number of cultivars developed with improved shelf life |
| Definition | Makes reference to the number of nutrient dense plant cultivars registered by the DALRRD Registrar, as per the Plant Breeders Rights Act and variety listing. A cultivar refers to a plant variety that has been produced in cultivation by breeding. The registered commodity with changes with respect to the length of storage time without becoming unfit for use, consumption, or sale. |
| Source of data | Certificate of Plant Breeders Right and/or signed letter for notifications of granting of varietal listing issued to the ARC |
| Method of Calculation / Assessment | Simple count of the Plant Breeders Right certificates and/or signed letter for notifications of granting of varietal listing issued to the ARC |
| Means of verification | Plant Breeders Right certificates and/or signed letter for notifications of granting of varietal listing issued to the ARC |

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| Assumptions | The adoption of ARC cultivars depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|---|
| Output | Post-harvest handling and agro-processing |
| Output Indicator 3.2.2 | Number of new post-harvest solutions developed |
| Definition | Development of new technologies that would contribute to food safety, quality and improved efficiencies in the agriculture value chain |
| Source of data | Technology evaluation report registered in the ARC Commercialisation Office |
| Method of Calculation / Assessment | Simple count of the number of technologies developed |
| Means of verification | Technology evaluation report registered in the ARC Commercialisation Office |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|--|
| Output | Post-harvest handling and agro-processing |
| Output Indicator 3.2.3 | Number of solutions for controlled atmosphere |
| Definition | Solutions for controlled atmosphere |
| Source of data | Report of solutions for controlled atmosphere |
| Method of Calculation / Assessment | Counting of solutions for controlled atmosphere |
| Means of verification | Report of solutions for controlled atmosphere |
| Assumptions | Availability of resources |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|---|
| Output | Post-harvest handling and agro-processing |
| Output Indicator 3.2.4 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered relating to post-harvest handling and agro-processing |
| Source of data | All invoices and/or job card numbers issued in respect of scientific services relating to post-harvest handling and agro-processing, i.e. diagnostic and analytical services, rendered. To some extent results of samples analysed are applicable |
| Method of Calculation / Assessment | Simple count of all invoices and/or job card numbers correlating to all (diagnostic and analytical) scientific services rendered |
| Means of verification | Invoices, job card numbers, results of samples including a report and/or invoice of consultations services relating to post-harvest handling and agro-processing |
| Assumptions | The ability of participants to request/demand services from the ARC |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |

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| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

OUTCOME 4: SKILLED AND CAPABLE AGRICULTURE SECTOR

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|---|---|
| Output | Skills development |
| Output Indicator 4.1.1 | Number of people trained |
| Definition | People, including extension agents, interns, post-doctoral, experiential learners who have been trained or attended training/workshops in-person or online per each course offered by the ARC |
| Source of data | Signed attendance registers and/or attendance list indicating i.e. initials and surname, present, screenshots, calendar appointment, etc. as a confirmation of attendance for online training/workshops |
| Method of Calculation / Assessment | Simple count of the number of people trained/or who attend a workshop, as captured on attendance registers and/or electronic attendance list and/or screenshot of all attending online training/workshops |
| Means of verification | Signed attendance registers and/or attendance list indicating i.e. initials and surname, present, screenshots, calendar appointment, etc. as a confirmation of attendance for online training/workshops |
| Assumptions | Availability of people to be trained |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: RIS |

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|---|--|
| Output | Skills development |
| Output Indicator 4.1.2 | Number of postgraduate students supported by ARC |
| Definition | Total number of supported (supervised) students graduating with postgraduate degrees (Masters and Doctoral) |
| Source of data | Certificates/Letter of confirmation of degree from HEI |
| Method of Calculation / Assessment | Simple count of number of students eligible to graduate and/or who have completed Master's and Doctoral degree studies |
| Means of verification | Certificates and/or a Letter of confirmation of degree from HEI |
| Assumptions | Availability of students to be trained |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Impact & Partnerships Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: RIS |

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|---|---|
| Output | Technology Transfer |
| Output Indicator 4.2.1 | Number of technologies/IP developed/registered |
| Definition | Makes reference to the number of ARC technologies registered such as patents registered, plant breeder's rights registered, trademarks registered and gene constructs. It also includes models and prototypes developed |
| Source of data | Report on agricultural intellectual property registered by the ARC, as well as prototypes/models developed or certificate/ proof of registration |
| Method of Calculation / Assessment | Simple count of the number of technologies registered |
| Means of verification | Report on agricultural intellectual property registered by the ARC and/or certificate of confirmation and/or proof of registration i.e. a letter |
| Assumptions | Assuming that financial and human resources will be available, suitable climatic conditions for farming, enabling policies and regulations and stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |

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| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: RIS |

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|---|---|
| Output | Technology Transfer |
| Output Indicator 4.2.2 | Number of enterprises supported |
| Definition | Support given to enterprises within the sector, public and/or farming communities |
| Source of data | Report of support given to enterprises within the sector, public and/or farming communities |
| Method of Calculation / Assessment | Counting the support given to enterprises as contained in the report |
| Means of verification | Report of support given to enterprises within the sector, public and/or farming communities |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|--|
| Output | Technology Transfer |
| Output Indicator 4.2.3 | Number of technologies transferred under licence |
| Definition | Makes reference to the number of ARC developed technologies that have been transferred under licence agreements. To indicate the number of ARC developed technologies that have been transferred to third parties, under a licence agreement |
| Source of data | Number of technologies transferred under licence |
| Method of Calculation / Assessment | Simple count of the number of technologies transferred under licence agreements, entered into with third parties. Licence agreements may include sub-licences issued across territories |
| Means of verification | Licence agreements signed |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Impact and Partnerships |

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|---|---|
| Output | Smallholder farmer supported |
| Output Indicator 4.3.1 | Number of farmers trained |
| Definition | Farmers who have been trained or attended training/workshops in-person per each module offered by the ARC |
| Source of data | Signed attendance registers and/or attendance list indicating, i.e. initials and surname, present, screenshots, calendar appointment, etc. as a confirmation of attendance for online trainings |
| Method of Calculation / Assessment | Simple count of the number of people trained/or who attend a workshop, as captured on attendance registers and/or electronic attendance list |
| Means of verification | Signed attendance registers and/or attendance list indicating, i.e. initials and surname, present, screenshots, calendar appointment, etc. as a confirmation of attendance for online trainings |
| Assumptions | Availability of people to be trained |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences |

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|-------------------------------|---|
| Output | Smallholder farmer supported |
| Output Indicator 4.3.2 | Number of technical assessments for commercial readiness |

ARC: Annual Performance Plan 2021/22

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|---|---|
| Definition | Assessment of farmers for commercial readiness with respect to each commodity |
| Source of data | Commercial readiness report |
| Method of Calculation / Assessment | Counting number of technical assessment |
| Means of verification | Commercial readiness report |
| Assumptions | Willingness of farmers to undergo the process |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

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|---|--|
| Output | Smallholder farmer supported |
| Output Indicator 4.3.3 | Number of smallholder farmers participating in KyD |
| Definition | The ARC is the custodian of the KyD (Kaonafatso ya Dikgomo) animal improvement scheme, which aims to develop rural communities by accelerating the participation of smallholder livestock farmers into mainstream industries. A smallholder farmer refers to an individual or a business entity undertaking farming for the purpose of household consumption and deriving a source of income from agriculture, forestry and activities along the value chain |
| Source of data | All smallholder farmers participating in the KyD scheme, as captured in INTERGIS |
| Method of Calculation / Assessment | Simple count of smallholder farmers, participating in KyD scheme, as captured in INTERGIS |
| Means of verification | INTERGIS report |
| Assumptions | Farmers willingness to participate in the scheme |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

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|---|---|
| Output | Smallholder farmer supported |
| Output Indicator 4.3.4 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered relating to smallholder farmer support services |
| Source of data | Report per each services rendered (submitted) relating to smallholder farmer support |
| Method of Calculation / Assessment | Counting number of test reports for services rendered including advisory services, analytical, consultation services issued |
| Means of verification | Report per each number of test / samples for services rendered including a report and/or invoice of consultations services relating to smallholder farmer support |
| Assumptions | Functional infrastructure and equipment |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

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|---|---|
| Output | Smallholder farmer supported |
| Output Indicator 4.3.5 | Number of farmer field days |
| Definition | The number of farmer field (knowledge exchange) days held or involving the ARC. |
| Source of data | Front page of field day report, attendance registers and a copy of programme of the event |
| Method of Calculation / Assessment | Simple count of the number of farmer field days held |
| Means of verification | Front page of field day report, attendance registers and a copy of programme of the event |
| Assumptions | Functional infrastructure and equipment and availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |

ARC: Annual Performance Plan 2021/22

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| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: RIS |
| Output | Farmer support |
| Output Indicator 4.4.1 | Number of farm assessments |
| Definition | Assessment of the status of farms and capacity of farmer with respect to each commodity |
| Source of data | Farm assessment report |
| Method of Calculation / Assessment | Counting number of farm assessment |
| Means of verification | Farm assessment report |
| Assumptions | Data will be made available |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: Impact and Partnerships |

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|---|---|
| Output | Farmer support |
| Output Indicator 4.4.2 | Number of farmers supported |
| Definition | The number of farmers supported through the rendering of scientific services |
| Source of data | All invoices issued/site visit sheets or reports/job card numbers linked to services rendered at National, Provincial and Local level farmer projects |
| Method of Calculation / Assessment | Simple count of all invoices issued/number of farmers engaged, as contained on site visit sheets or reports/job numbers linked to services rendered at National, Provincial and Local level farmer projects |
| Means of verification | All invoices issued/site visit sheets or reports/job card numbers linked to services rendered at National, Provincial and Local level farmer projects |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: RIS |

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|---|--|
| Output | Farmer support |
| Output Indicator 4.4.3 | Number of farmer field days |
| Definition | The number of farmer field days (knowledge exchanges) held or involving the ARC |
| Source of data | Field day report, attendance registers and a copy of programme of the event |
| Method of Calculation / Assessment | Simple count of the number of farmer field days held |
| Means of verification | Copy of front page of field day report, attendance registers and a copy of programme of the event |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: Impact and Partnerships |

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| Output | Farmer support |
| Output Indicator 4.4.4 | Number of services rendered |

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|---|---|
| Definition | The amount of analytical, diagnostic and advisory services rendered relating to farmer support services |
| Source of data | Report and/or invoice and/or job card numbers per each sample analysed and/or services rendered (submitted) relating to farmer support services. The invoices and/or job card varies across campuses. For some campuses, a general release permit is applicable |
| Method of Calculation / Assessment | Counting number of reports and/or invoice and/or job card per each number of test reports for services rendered including advisory services, analytical services issued |
| Means of verification | Report and/or invoice and/or job card per each number of test / samples issued for services rendered including a report and/or invoice of consultations services relating to farmer support services |
| Assumptions | Functional infrastructure and equipment |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: RIS |

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|---|---|
| Output | Knowledge generated and dissemination |
| Output Indicator 4.5.1 | Number of scientific publications |
| Definition | ARC research and development (R&D) outputs, i.e. scientific publications that are contained in refereed journals, chapters in books, full-length conference proceedings and theses |
| Source of data | All research published in reference to articles in refereed journals, chapters in books, full-length conference proceedings, and theses |
| Method of Calculation / Assessment | Simple count of scientific publications appearing in the defined sources |
| Means of verification | A copy of the front/title page of articles in refereed journals, chapters in books, full-length papers in conference proceedings and theses. Chapters in books also require a copy of the cover/title page and table of contents of the book, whilst theses also require a copy of the award letter or degree certificate |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: RIS Group Executive: Impact and Partnerships |

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|---|--|
| Output | Knowledge generated and dissemination |
| Output Indicator 4.5.2 | Number of popular publications |
| Definition | Number of popular publications developed, e.g. magazines, newspaper or trade publications like articles in Farmer's Weekly, etc. |
| Source of data | Copy of a popular publication, with date of publication |
| Method of Calculation / Assessment | Simple count of the number of popular publications developed (quantitative) |
| Means of verification | A copy of the front/ title page and/or cover of the popular article as well as the cover page of the journal issue in which it appears, with date of publication |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: RIS Group Executive: Impact and Partnerships |

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|---|---|
| Output | Knowledge generated and dissemination |
| Output Indicator 4.5.3 | Number of public awareness events |
| Definition | This refers to public awareness events/activities were ARC officials are participating in or contributing to in relation to agriculture and/or any other events/session affecting the agricultural sector. These include webinars, news clippings, TV and radio interviews, Forum presentations, conferences, congresses, symposia, exhibitions, e.g. NAMPO, etc. |
| Source of data | Report per each awareness event/activity/session ARC official participating in the form of a dialogue and discussion forum or keynote speech or oral/poster presentation or exhibition |
| Method of Calculation / Assessment | Simple count per each awareness event/activity/session ARC official participating in the form of a dialogue and discussion forum or keynote speech or oral/poster presentation or exhibition |
| Means of verification | Report per each awareness event/activity/session ARC official participating in the form of a dialogue and discussion forum or keynote speech or oral/poster presentation or exhibition |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: RIS Group Executive: Impact and Partnerships |

OUTCOME 5: ENHANCED RESILIENCE OF AGRICULTURE

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|---|--|
| Output | Climate resilient solutions |
| Output Indicator 5.1.1 | Number of climate resilient solutions adopted |
| Definition | Makes reference to the number of ARC climate resilient solutions adopted |
| Source of data | Report on number of solutions adopted |
| Method of Calculation / Assessment | Simple count of the number of solutions |
| Means of verification | Report on number of solutions adopted |
| Assumptions | Willingness of stakeholders |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|---|
| Output | Climate resilient solutions |
| Output Indicator 5.1.2 | Number of drought tolerant cultivars |
| Definition | Makes reference to the number of plant cultivars registered by DALRRD Registrar, as per the Plant Breeders Rights Act and variety listings for drought tolerant cultivars. A cultivar refers to a plant variety that has been produced in cultivation by breeding |
| Source of data | Certificate of Plant Breeders Right and/or signed letter for notifications of granting of varietal listing issued to the ARC |
| Method of Calculation / Assessment | Simple count of the Plant Breeders Right certificates and/or signed letter for notifications of granting of varietal listing issued to the ARC |
| Means of verification | Plant Breeders Right certificates and/or signed letter for notifications of granting of varietal listing issued to the ARC |
| Assumptions | The adoption of ARC cultivars depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |

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| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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| Output | Climate resilient solutions |
| Output Indicator 5.1.3 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered linked to climate related services |
| Source of data | All invoices and/or job card numbers issued in respect of scientific services, i.e. diagnostic and analytical, consultation services, rendered linked to climate related services. The invoices and job card varies across campuses. For some campuses, a general release permit is applicable |
| Method of Calculation / Assessment | Simple count of all invoices and/or job card numbers as well as general release permits correlating to all (diagnostic and analytical, including consultations) scientific services rendered |
| Means of verification | All invoices and/or job card numbers issued in respect of scientific services, i.e. diagnostic and analytical services, rendered including a report and/or invoice of consultations services linked to climate related services |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: RIS |

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|---|---|
| Output | Climate resilient solutions |
| Output Indicator 5.1.4 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture commodity resilience, intended for distribution and use by farmers, extensions officers, commodity groups/organisations, and other interested parties. The ARC employees writes various research outputs report for distribution to stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports and/or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | Depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries) | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences Group Executive: RIS |

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| Output | Climate resilient solutions |
| Output Indicator 5.1.5 | Number of field trials |
| Definition | The ARC undertakes various R&D field trials in order to, amongst others; determine the climatic resilience under certain farming environments/conditions on various farms across South Africa. Field trials occur when the ARC plant cultivars to conduct and undertake research trials to determine the yield and nutritional potential among other things the climatic requirements under certain farming environments/conditions on various farms across South Africa |
| Source of data | Simple count of all GPS coordinates reflecting the exact location or number of reports of field trials attributed to ARC with verifiable evidence such as dates and time, type of variety for trials that have similar GPS coordinates but different trials |
| Method of Calculation / Assessment | Global Positioning System (GPS) coordinates for each trial/s or a technical report with verifiable evidence such as dates and time, type of variety or trials that have similar GPS coordinates but different trials |
| Means of verification | Global Positioning System (GPS) coordinates for each trial/s or a technical report with verifiable evidence such as dates and time, type of variety, photos etc. for trials that have similar GPS coordinates but different trials |

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| Assumptions | The planting of ARC cultivars depends on community acceptance, favourable planting climate condition, availability of financial and human resources, enabling policies and regulations as well as stakeholder mobilisation and partnerships |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|--|
| Output | Climate resilient solutions |
| Output Indicator 5.1.6 | Number of tools for measuring climate change |
| Definition | Refers to tools for measuring climate change including weather stations, calculation methods, new apps |
| Source of data | Report on the tools for measuring climate change |
| Method of Calculation / Assessment | Simple count of number of tools for measuring climate change |
| Means of verification | Report on the tools for measuring climate change |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences Group Executive: RIS |

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|---|--|
| Output | Vaccine production |
| Output Indicator 5.2.1 | Number of blood vaccine doses produced |
| Definition | This refers to the number of tick borne disease vaccine produced for the agricultural sector to protect the livestock population to enhanced resilience. These vaccines include Heart-water, African Redwater, Asiatic Redwater and Anaplasmosis |
| Source of data | Number of vaccine doses produced and supplied to the client |
| Method of Calculation / Assessment | Simple count of the number of vaccine doses suitable for distribution to the client |
| Means of verification | A Quality Assurance Report from the Quality Officer |
| Assumptions | That the client will order these vaccines |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

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|---|--|
| Output | Vaccine production |
| Output Indicator 5.2.2 | Number of different types of vaccines developed |
| Definition | This refers to the number of vaccine types produced for the agricultural sector to protect the livestock population to enhance food security |
| Source of data | Report of number of vaccine types produced and supplied to the client |
| Method of Calculation / Assessment | Simple count of the number of vaccine types suitable for distribution to the client as contained in the report |
| Means of verification | Report indicating number of vaccine types produced and supplied to the client |
| Assumptions | That the client will order these vaccines |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

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|---|---|
| Output | Vaccine production |
| Output Indicator 5.2.3 | Number of FMD vaccine doses produced |
| Definition | This refers to the number of FMD (Foot and Mouth Disease) vaccines produced for the livestock sector for prevention and control |
| Source of data | Number of vaccine doses produced |
| Method of Calculation / Assessment | Simple count of the number of vaccine doses produced |
| Means of verification | A Quality Assurance Report from the Quality Officer |
| Assumptions | That the client will order the vaccine |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Science |

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|---|--|
| Output | Vaccine production |
| Output Indicator 5.2.4 | Number of vaccine clinical trials |
| Definition | This refers to the number of vaccines trials conducted for improved prevention and control |
| Source of data | Number of vaccine trials conducted |
| Method of Calculation / Assessment | Simple count of the number of vaccine trials conducted |
| Means of verification | Report of number of vaccine trials conducted |
| Assumptions | That researchers will conduct the vaccine trials |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Science |

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|---|--|
| Output | Laboratory services |
| Output Indicator 5.3.1 | Number of tests reports issued for animal health |
| Definition | This refers to the total number of signed tests reports (typed or handwritten) issued to clients (per disease or condition) by the different diagnostic and analytical laboratories of the Animal Health Campus of the ARC |
| Source of data | Number of signed test reports (typed or handwritten) issued to client (per disease or condition) by the different diagnostic and analytical laboratories of the ARC |
| Method of Calculation / Assessment | Simple count of the number of signed test reports (typed or handwritten) (per disease or condition) issued by the different diagnostic and analytical laboratories of the ARC |
| Means of verification | Copy of the signed test report (typed or handwritten) (per disease or condition) issued to a client by the diagnostic and analytical laboratories of the ARC |
| Assumptions | Continued need of diagnostic and analytical tests by clients |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meet target sets for 2021/2022 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

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|---|---|
| Output | Laboratory services |
| Output Indicator 5.3.2 | Number of tests performed for food and feed |
| Definition | This refers to the number of quality diagnostic and analytical tests performed by the ARC relating to food and feed analysis related to laboratory services |
| Source of data | Number of diagnostic and analytical test reports issued to client related to laboratory services |
| Method of Calculation / Assessment | Simple count of number of test reports issued to clients |
| Means of verification | Copy of the test report issued to the client related to laboratory services |
| Assumptions | Continued need of diagnostic and analytical tests by clients |
| Disaggregation of Beneficiaries | Not applicable |

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|---------------------------------|-----------------------------------|
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting target set for 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

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|---|---|
| Output | Laboratory services |
| Output Indicator 5.3.3 | Number of services rendered |
| Definition | The amount of analytical, diagnostic and advisory services rendered related to laboratory services |
| Source of data | Report and/or invoice and/or job card numbers issued to clients as per each number of diagnostic and analytical test including a report and/or invoice of consultations services related to laboratory services |
| Method of Calculation / Assessment | Simple count of number of reports and/or invoice and/or job card per each service rendered as per report and/or invoice issued to clients |
| Means of verification | Report and/or invoice and/or job card issued to clients as per each number of diagnostic and analytical test including a report and/or invoice of consultations services related to laboratory services |
| Assumptions | Continued need of diagnostic and analytical tests by clients |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting target set for 2021/22 FY |
| Indicator Responsibility | Group Executive: Crop Sciences |

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|---|---|
| Output Indicator 5.3.4 | Number of technical reports |
| Definition | Key to the outputs of the ARC R&D activities is the development of various technical/client reports. These technical/client reports and/or manuals/guides offer a broad agriculture commodity resilience, intended for distribution and use by farmers, extensions officers, commodity groups/organisations, and other interested parties. The ARC employees writes various research outputs report for distribution to stakeholders/clients ranging from farmers and or public on various products, services and process. The format of reports may differ with respect to difference in intended recipients. This official reports contains results of services issued by the ARC to farmers participating in schemes such as animal improvement as well as reports to other stakeholders |
| Source of data | Technical/client reports and/or manuals/guides |
| Method of Calculation / Assessment | Simple count of the technical/client reports and/or manuals/guides developed |
| Means of verification | Front cover of technical/client reports and/or manuals/guides |
| Assumptions | The researchers will produce the technical reports |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting target set for 2021/22 FY |
| Indicator Responsibility | Group Executive: Animal Sciences |

OUTCOME 6: A HIGH PERFORMING AND SUSTAINABLE ORGANISATION

| | |
|---|--|
| Output | Infrastructure Management |
| Output Indicator 6.1.1 | Number of business cases implemented for assets management |
| Definition | This refers to disposal / transfer of assets that do not form part of the ARC strategy |
| Source of data | Cost savings on maintenance and operation expenditures |
| Method of Calculation / Assessment | Count of business cases implemented for assets transferred back to Public Works and other state institutions |
| Means of verification | Business case report of cost savings on maintenance and operation expenditures |
| Assumptions | Assets will be utilised by stakeholders |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |

| | |
|---------------------------------|--|
| Reporting Cycle | Annual |
| Desired Performance | Meeting targets set for the 2021/22 FY |
| Indicator Responsibility | Group Executive: Information Systems |

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|---|--|
| Output | Infrastructure Management |
| Output Indicator 6.1.2 | Increase in rand value of rental income |
| Definition | Increase in rental income |
| Source of data | New signed leases entered into |
| Method of Calculation / Assessment | 3% year on year |
| Means of verification | Number of new signed leases entered into |
| Assumptions | Lease agreements on rental will be signed |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting target set for 2021/22 FY |
| Indicator Responsibility | Group Executive: Information Systems |

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|---|---|
| Output | ICT Strategy Implementation |
| Output Indicator 6.2.1 | Number of digital transformation projects implemented |
| Definition | Digital transformation initiatives implementation projects |
| Source of data | Projects sign-off documents |
| Method of Calculation / Assessment | Counting number of digital transformation projects |
| Means of verification | Sign-offs documents towards digital transformation initiatives or screen dumps of implemented solutions |
| Assumptions | Utilisation of digitalised solutions |
| Disaggregation of Beneficiaries | Not Applicable |
| Spatial Transformation | Not Applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting target set for 2021/22 FY |
| Indicator Responsibility | Group Executive: Information Systems |

| | |
|---|---|
| Output | ICT Strategy Implementation |
| Output Indicator 6.2.2 | Number of stabilisation projects implemented |
| Definition | The purpose of the indicator is to track the stabilisation of current solutions |
| Source of data | Report of number of stabilisation projects implemented |
| Method of Calculation / Assessment | Counting number of stabilisation projects |
| Means of verification | Sign-off documents |
| Assumptions | Stabilization of current solutions |
| Disaggregation of Beneficiaries | Not Applicable |
| Spatial Transformation | Not Applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting target set for 2021/22 FY |
| Indicator Responsibility | Group Executive: Information Systems |

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|---|--|
| Output | ICT Strategy Implementation |
| Output Indicator 6.2.3 | Number of optimisation projects implemented |
| Definition | Optimisation of current solutions |
| Source of data | Number of optimisation projects implemented |
| Method of Calculation / Assessment | Counting number of optimisation projects |
| Means of verification | Sign off documents |
| Assumptions | Optimised solutions |
| Disaggregation of Beneficiaries | Not Applicable |
| Spatial Transformation | Not Applicable |

ARC: Annual Performance Plan 2021/22

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|---------------------------------|--------------------------------------|
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting target set for 2021/22 FY |
| Indicator Responsibility | Group Executive: Information Systems |

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|---|--|
| Output | Human Resources Management |
| Output Indicator 6.3.1.1 | Vacancy rate |
| Definition | The number of funded vacant positions, divided by the total number of funded positions within the whole organisation, multiplied by 100 equals your vacancy rate |
| Source of data | Vacancy and Positions Report |
| Method of Calculation / Assessment | The number of funded vacancies for the specific financial year calculate as a percentage of the total funded positions |
| Means of verification | Vacancy and Positions Report |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting target set for 2021/22 FY |
| Indicator Responsibility | Group Executive: Human Resources and Legal Services |

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|---|--|
| Output | Human Resources Management |
| Output Indicator 6.3.1.2 | Support employees as percentage of total staff |
| Definition | Total number of support staff as a percentage of total staff. (Support staff excludes Research Support, Labourers, Artisans, and Farm personnel) |
| Source of data | Headcount report |
| Method of Calculation / Assessment | Simple calculation of support staff as a percentage of total staff compliment |
| Means of verification | Headcount report |
| Assumptions | Availability of resources |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Desired ratio |
| Indicator Responsibility | Group Executive: Human Resources and Legal Services |

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|---|--|
| Output Indicator 6.3.1.3 | Percentage increase of Employment equity ratio in the designated groups in core business, in respect of: - Women at Senior Management level - People with Disabilities Employed |
| Definition | An increase in percentage of employees in designated areas (Women and People with disabilities) as a proportion of total staff |
| Source of data | Report on employment equity |
| Method of Calculation / Assessment | Simple calculation of support staff as a percentage of total staff compliment |
| Means of verification | Report on employment equity |
| Assumptions | Recruitment process |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Desired ratio |
| Indicator Responsibility | Group Executive: Human Resources and Legal Services |

| | |
|---------------------------------|---|
| Output | Performance management |
| Output Indicator 6.3.2.1 | Improve the leadership dimensions of 360 degree results for Senior and Executive Management |
| Definition | The purpose of the indicator is to track an increase in the overall performance of Senior and Executive Managers on leadership dimensions of 360 degree framework |
| Source of data | Report on 360 leadership dimension |

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|---|---|
| Method of Calculation / Assessment | Increase in scores within report containing the results on 360 degree leadership dimensions |
| Means of verification | Report of 360 leadership dimensions |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Increase in 360 leadership dimension performance |
| Indicator Responsibility | Group Executive: Human Resources and Legal Services |

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|---|---|
| Output | Performance management |
| Output Indicator 6.3.2.2 | Alignment of organisational values of ARC |
| Definition | The purpose of the indicator is to track the alignment of ARC values in the overall performance of Senior and Executive Managers on the 360 degree assessment |
| Source of data | Report on 360 degree leadership assessment highlighting the ARC value alignment scores |
| Method of Calculation / Assessment | Increase in the scores pertaining to the ARC value alignment as contained in the 360 leadership assessment report |
| Means of verification | Report on the 360 leadership assessment |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Increase in 360 leadership assessment performance |
| Indicator Responsibility | Group Executive: Human Resources and Legal Services |

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|---|---|
| Output | Performance management |
| Output Indicator 6.3.2.3 | Percentage implementation of change management strategies linked to Culture Survey and 360 degree assessment |
| Definition | The purpose of the indicator is to track implementation of the change management strategies, which resulted from the Culture Survey and 360 degree assessment |
| Source of data | Reports indicating completed implementation plans, linked to change management strategies |
| Method of Calculation / Assessment | Simple calculation of the percentage completion of the implementation plans linked to change management strategies |
| Means of verification | Reports on the number of completed implementation plans, linked to change management strategies |
| Assumptions | Implementation plans will be developed and actioned |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Completion of change management strategies linked to Culture Survey and 360 degree assessment |
| Indicator Responsibility | Group Executive: Human Resources and Legal Services |

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|---|--|
| Output | Human Resource Development |
| Output Indicator 6.3.4.1 | Number of employees appointed with: Masters degrees |
| Definition | Total number of new employees appointed with Masters degrees |
| Source of data | Copies of proof of qualification |
| Method of Calculation / Assessment | Simple count of number of new employees who have completed Master's degree studies |
| Means of verification | Copies of proof of qualification |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting targets set for the 2020/21 FY |
| Indicator Responsibility | Group Executive: Human Resources and Legal Services |

ARC: Annual Performance Plan 2021/22

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|---|--|
| Output | Human Resource Development |
| Output Indicator 6.3.4.2 | Number of employees appointed with: Doctoral degrees |
| Definition | To indicate new staff employed with Doctoral degrees |
| Source of data | Copies of proof of qualification |
| Method of Calculation / Assessment | Simple count of number of new employees who have completed Doctoral degree studies |
| Means of verification | Copies of proof of qualification |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting targets set for the 2020/21 FY |
| Indicator Responsibility | Group Executive: Human Resources and Legal |

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|---|--|
| Output | Human Resource Development |
| Output Indicator 6.3.4.3 | Number of employees with: Masters degrees |
| Definition | Total number of SET employees with Masters degrees |
| Source of data | Copies of proof of qualification |
| Method of Calculation / Assessment | Simple number of employees with masters certificates and/or qualification as the highest qualification |
| Means of verification | Copies of proof of qualification |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting targets set for the 2020/21 FY |
| Indicator Responsibility | Group Executive: Human Resources and Legal |

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|---|---|
| Output | Human Resource Development |
| Output Indicator 6.3.4.4 | Number of employees with: Doctoral degrees |
| Definition | Total number of SET employees with Doctoral degrees |
| Source of data | Copies of proof of qualification |
| Method of Calculation / Assessment | Simple number of employees with doctoral certificates and/or qualification as the highest qualification |
| Means of verification | Copies of proof of qualification |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting targets set for the 2020/21 FY |
| Indicator Responsibility | Group Executive: Human Resources and Legal |

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| Output | Human Resource Development |
| Output Indicator 6.3.4.5 | Percentage staff turnover |
| Definition | Total number of employees who were terminated |
| Source of data | VIP Variance report on appointments and terminations |
| Method of Calculation / Assessment | Counting number of terminations (Voluntary resignations and Early retirements) divided by the total number of total staff over the period, as a percentage |
| Means of verification | VIP Variance report on appointments and terminations |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting targets set for the 2020/21 FY |

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| Indicator Responsibility | Group Executive: Human Resources and Legal |
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| Output | Human Resource Development |
| Output Indicator 6.3.4.6 | Total spend on PDP stipend and registration |
| Definition | Total rand value spend on stipends of PDP students tuition and stipends |
| Source of data | Variance Report |
| Method of Calculation / Assessment | Rand Value of PDP spend |
| Means of verification | Variance Report |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting targets set for the 2020/21 FY |
| Indicator Responsibility | Group Executive: Human Resources and Legal |

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|---|---|
| Output | Human Resource Development |
| Output Indicator 6.3.4.7 | Training spent as a % of salary bill |
| Definition | The total percentage of amount spent on training as a percentage of total salary bill |
| Source of data | Invoiced rand value of training spent |
| Method of Calculation / Assessment | The amount of money spent on training divided by salary bill as a percentage |
| Means of verification | Invoiced rand value of training spent |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting targets set for the 2020/21 FY |
| Indicator Responsibility | Group Executive: Human Resources and Legal |

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|---|---|
| Output | Commercialisation of ARC solutions |
| Output Indicator 6.4.1 | Establishment of an ARC commercialisation entity |
| Definition | ARC commercialisation entity established |
| Source of data | Proof of established entity |
| Method of Calculation / Assessment | Counting of established entity |
| Means of verification | Proof of established entity |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-end) |
| Reporting Cycle | Annual |
| Desired Performance | Established entity |
| Indicator Responsibility | Group Executive: Impact and Partnerships |

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|---|---|
| Output | Exhibitions and sponsorships |
| Output Indicator 6.4.2 | Number of exhibitions and sponsorships |
| Definition | Refers to number of ARC and sectoral events participated in |
| Source of data | Reporting and budget spent |
| Method of Calculation / Assessment | Counting of events |
| Means of verification | Reporting and budget spent |
| Assumptions | Availability of funding |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |

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|---------------------------------|--|
| Reporting Cycle | Quarterly |
| Desired Performance | Increase in events |
| Indicator Responsibility | Group Executive: Impact and Partnerships |

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|---|--|
| Output | International partnerships |
| Output Indicator 6.4.3 | Number of new international partnerships |
| Definition | Report on the number of new ARC institutional international partnerships |
| Source of data | Partnership / cooperation agreements and/or letters of intent to cooperation/note verbale to confirm the cooperation |
| Method of Calculation / Assessment | Counting of partnership agreements |
| Means of verification | Partnership / cooperation agreements and/or letters of intent to cooperation/note verbale to confirm the cooperation |
| Assumptions | Availability of resources |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Increase in partnerships established |
| Indicator Responsibility | Group Executive: Impact and Partnerships |

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|---|---|
| Output | Governance |
| Output Indicator 6.5.1 | Audit opinion |
| Definition | The audit opinion issued by the External Auditors on the Financial statements of the ARC, including compliance to laws and legislation. This includes Statement of Financial Performance, Statement of Financial Position, Statement of Changes in Equity or Net Assets, Cash Flow statements and Notes to the Financial Statements |
| Source of data | Annual Financial Statements and supporting documentation submitted to the auditors |
| Method of Calculation / Assessment | Annual Financial Statements prepared in accordance with GRAP. Compliance tested against the prevailing legislation (e.g. PFMA; AR Act, etc.) |
| Means of verification | Annual Financial Statements and supporting documentation submitted to the auditors |
| Assumptions | Assumptions will be as per the accounting policy |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-end) |
| Reporting Cycle | Annual |
| Desired Performance | Desired audit opinion |
| Indicator Responsibility | Chief Financial Officer |

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|---|---|
| Output | Funding and revenue generation |
| Output Indicator 6.6.1 | Zero Deficit |
| Definition | The ARC's Financial Performance must at minimum report the Operating surplus / (deficit) of Zero, (i.e. the Opex should not be greater than the Revenue). This includes Parliamentary Grant, External Income, Other Income, Personnel Costs, Operating Expenses, and Depreciation |
| Source of data | Financial results (Statement of Financial Performance) prepared from the data from the AX system |
| Method of Calculation / Assessment | Revenue less Total Operating Expenditure |
| Means of verification | Financial results (Statement of Financial Performance) prepared from the data from the AX system |
| Assumptions | None |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting acceptable zero deficit performance |
| Indicator Responsibility | Chief Financial Officer |

| | |
|-------------------------------|---|
| Output | Funding and revenue generation |
| Output Indicator 6.7.1 | BBBEE rating |
| Definition | The Broad Based Black Economic Empowerment as defined by the BBBEE Act for management control, skills development, enterprise and supplier development and socio-economic development |

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| Source of data | BBBEE Certificate |
| Method of Calculation / Assessment | Assessment done by the Accredited BBBEE verification agent |
| Means of verification | BBBEE Certificate |
| Assumptions | None |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Meeting the acceptable BBBEE rating |
| Indicator Responsibility | Chief Financial Officer |

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|---|---|
| Output | Funding and revenue generation |
| Output Indicator 6.8.1 | External income as % of total revenue |
| Definition | The external income's contribution to the total revenue of the ARC made from advisory services, diagnostic services, farm products, research material and research services |
| Source of data | Monthly Financial Results prepared from the AX |
| Method of Calculation / Assessment | External Income / Total revenue |
| Means of verification | Monthly Financial Results prepared from the AX |
| Assumptions | None |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | External income of 30% |
| Indicator Responsibility | Chief Financial Officer |

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|---|---|
| Output | Funding and revenue generation |
| Output Indicator 6.10.1 | Rand value of royalty income |
| Definition | Income received from royalty agreements signed |
| Source of data | Finance report on royalties |
| Method of Calculation / Assessment | Based on the IP contracts and actual income generated/collected |
| Means of verification | Finance report on royalties |
| Assumptions | Willingness of parties to enter into agreement with ARC |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Cumulative (Year-to-Date) |
| Reporting Cycle | Quarterly |
| Desired Performance | Meeting targets set for the 2020/21 FY |
| Indicator Responsibility | Chief Financial Officer GE: Impact and Partnerships |

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|---|---|
| Output | Cost efficiencies |
| Output Indicator 6.11.1 | Reduction in fixed cost |
| Definition | To measure the reduction in fixed costs as compared to the base / prior year in the form of Personnel costs, Electricity / Water/ Services, Maintenance and Security Services |
| Source of data | Monthly Financial Results prepared from the AX |
| Method of Calculation / Assessment | Actual Fixed costs vs Base Fixed Costs |
| Means of verification | Monthly Financial Results prepared from the AX |
| Assumptions | None |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | Reduction by 5% |

| | |
|---|---|
| Indicator Responsibility | Chief Financial Officer |
| Output | Cost efficiencies |
| Output Indicator 6.11.2 | Personnel costs as % of Operational PG |
| Definition | To measure the personnel costs in relation to the operational parliamentary grant |
| Source of data | Monthly Financial Results prepared from the AX |
| Method of Calculation / Assessment | Personnel costs / operational parliamentary grant |
| Means of verification | Monthly Financial Results prepared from the AX |
| Assumptions | None |
| Disaggregation of Beneficiaries | Not applicable |
| Spatial Transformation | Not applicable |
| Calculation Type | Non-Cumulative |
| Reporting Cycle | Annual |
| Desired Performance | 80% |
| Indicator Responsibility | Chief Financial Officer Group Executive: Human Resources and Legal Services |

ANNEXURES TO THE ANNUAL PERFORMANCE PLAN

ANNEXURE A: AMENDMENTS TO THE STRATEGIC PLAN

Not applicable for 2021/22, as the second year of the 2020/21–2024/25 Strategic Plan.

ANNEXURE B: CONDITIONAL GRANTS

Not applicable to the Agricultural Research Council.

ANNEXURE C: CONSOLIDATED INDICATORS

Not applicable to Agricultural Research Council.

ANNEXURE D: DISTRICT DEVELOPMENT MODEL

Not applicable to Agricultural Research Council.

ANNEXURE E: BOARD AND SUB-COMMITTEE CHARTERS

It is hereby affirmed that the Agricultural Research Council has approved Board and Sub-Committee charters in place, which are available.

ANNEXURE F: SWOT, PESTEL and STAKEHOLDER ANALYSIS

UPDATED SWOT ANALYSIS – INFORMING 2021/22 PLANNING

The SWOT Analysis (not in any order of priority) presented in the ARC Strategic Plan was reviewed and updated, to include responses specifically aimed at the remainder of 2020/21 and for 2021/22:

| EXTERNAL ENVIRONMENT – THREATS | | | |
|--------------------------------|--|--|---|
| No. | Threat | What about the threat must be mitigated for the remainder of 2020/21? | What about the threat can be mitigated in 2021/22? |
| 1 | Inadequate/ Reduction of Parliamentary Grant | <ul style="list-style-type: none"> Focus on project completion as much as possible, specifically where the Covid-19 pandemic caused delays Expedite collection of external income Establish a multidisciplinary team to develop a project rationalisation matrix Cost containment measures as presented per campus, including operating expenses, rationalising of research areas and staff. This to be expanded to ARC wide approach as campuses have cut what they could Discontinue unfunded projects/reprioritise programs ARC wide Intercept last minute demand for services by provincial departments of agriculture Explore alternative funding sources Engage National Treasury, DALRRD and DSI. Implement campus rationalisation and amalgamation processes Develop and implement a robust commercialisation pipeline based on sound financial business cases | <ul style="list-style-type: none"> Implement staff and research rationalisation programme. Develop strategies for growth. Grow research and commercialisation and ensure support is more effective efficient and turnaround times are improved. Reprioritise research programmes and discontinue projects that are 100% funded by PG. ARC to find a way to strike a balance here. ARC need to invest in seed projects for future business and a different funding model should be developed to allow for these type of business interventions for future value creation, but this must be an organisational wide drive. E.g. if ARC wants to develop increased agro-processing capacity and value chains dedicated funding must be available for this to ensure IP and commercialisation will be created in future for increased revenue and value. Identify new sources of contract research funding, this is critical to ensure ARC IP is protected and value is derived from it through licencing agreements, spin-off and spinout companies, etc. Engage provincial departments of agriculture to provide services. Engage National Treasury and explore alternative funding sources, initiate right-sizing, rationalisation of projects. Discontinue all unfunded research mandates Increased commercialisation processes and fast tracking of commercialisation initiatives in the ARC, but be competitive and streamline business processes to facilitate this. Business must run as a business. Implement relocation of campuses on fewer campuses in Pretoria to create significant cost saving which can be used for staff retention, performance management, incentives for performance, and seed funding for new initiatives, etc. Sell/lease fixed assets that does not create value for ARC and absorbs money that could be used elsewhere and use the income generated from sales/leases to recapitalise other areas of growth. Leverage increased public-private partnerships for ARC ventures Be a more agile Institution, which can make good decisions much quicker and can act on business opportunities through a properly defined delegations of authority and much shorter decision turnaround times. |

| EXTERNAL ENVIRONMENT – THREATS | | | |
|--------------------------------|--|---|--|
| No. | Threat | What about the threat must be mitigated for the remainder of 2020/21? | What about the threat can be mitigated in 2021/22? |
| 2 | Loss of external income | <ul style="list-style-type: none"> Commodity trusts and Departments (DALRRD, DEFF) – high-level intervention of CEO, GE and SM with relevant stakeholders | <ul style="list-style-type: none"> Implement relationship improvement plan with Commodity Trust partners. DALRRD and ARC to work more closely to enable combined planning. Increase international collaboration to broaden the ARC income base Leverage increased public private partnerships for ARC ventures. Identify these ventures and allocate resources to drive them. Create an Agriculture University in partnership with one/several universities in SA. Focus on postgraduate qualifications and develop this university in way with a business model that will ensure ARC benefit from incentives for graduates and publications and can leverage the investment in the PDP in an income generation model for the ARC. E.g. ARC invests x millions in student bursaries, how do we engage the Department of Higher Education to develop a model that incentivise the ARC further. Lease or sell unused properties/farms, etc. and recapitalise others for future growth. |
| 3 | Increased competition for funding | <ul style="list-style-type: none"> Identify top five competitors in all research or commodity categories. Review project-costing model of ARC (personnel costs). Improve turnaround time by bringing forward project initiation. Collaboration and partnerships | <ul style="list-style-type: none"> Exploit the weaknesses of the competitors. Target research funds allocated to provincial departments of agriculture. Institutionalise proposal coordination capability. Diversifying products and services. Recruitment of high-end skills. Increase investment in modern technologies and infrastructure. Work collectively as ARC and consolidate programs. Coordinate through grants office to create one-stop-shop. Knowledge packaging, management and dissemination for economic gain. Be more agile and create environment where business opportunities can be agreed to much quicker. Increase decision timelines and shorten the decision-making chain by appropriate delegations. Give more responsibilities downstream and keep people accountable. Decrease red tape without compromising quality and compliance, it is possible. ARC need to start to work, react, and function as a business. |
| 4 | Climate change – water shortage for research functions (elevated temperatures) | <ul style="list-style-type: none"> Review mitigation strategy planning. Develop water-harvesting projects. Investigate agro-ecology and conservation agriculture approaches Request disaster relief funds. | <ul style="list-style-type: none"> Establish international collaboration on climate change research, initiate data collection for long term modelling. Implement water-harvesting projects. Prioritise Climate Change research mitigation and adaptation. Forecasting and aligning research toward future trends i.e. breeding for resilience to climatic factors. Establish a research centre of excellence for climate smart agriculture in the ARC, demonstrate the ARC technologies in this regard, and market the ARC competencies more actively. ARC wide plan driven by all is required. |

| EXTERNAL ENVIRONMENT – THREATS | | | |
|--------------------------------|---|---|---|
| No. | Threat | What about the threat must be mitigated for the remainder of 2020/21? | What about the threat can be mitigated in 2021/22? |
| 5 | Reduced industry support for ARC programmes/ARC losing impact | <ul style="list-style-type: none"> Identify the negative perceptions at the Commodity Trusts. Immediately engage with the Commodity Trusts (Maize Trust, Winter Cereal Trust, Hortgro, Winetech, PRF, OPOT, PSA, etc.). Stakeholder engagement, develop institute research reports. | <ul style="list-style-type: none"> Work collectively as ARC and consolidate programs. Stakeholder engagement at SM, GE and CEO level. Define internal R&D priorities. Continuous engagement with Industries and specific role ARC can play for them. Delivery of excellent research services to industries to increase and restore industry confidence in ARC. Engage on funding models that is a win-win for all, e.g. Leverage industry funding to support ARC Centres of Excellence and leverage this partnership to increase university funding into the collaboration centres. |
| 6 | Aging infrastructure and equipment | <ul style="list-style-type: none"> ARC wide reprioritisation on capital goods. Strategic purchase of CAPEX Centralised versus scattered and duplicated labs | <ul style="list-style-type: none"> Allocate adequate Capex to buy equipment. Consider recommendations of the ARC wide Environmental Scan report in capex funding allocation. Invest capex in growth areas and monitor progress and return on investment. Lease or sell unused properties/farms etc. and recapitalise others for future growth. Public/private partnerships where partners invest capital in long term agreements. Develop proposals for external funding for new infrastructure and equipment. |
| 7 | Rising input costs in the research environment (consumables, electricity, travel, etc.) | <ul style="list-style-type: none"> Immediately analyse and correct pricing category (e.g. industrial or agriculture rates). Identify and optimise occupation of buildings. Implement contract procurement when appropriate Engage input suppliers (e.g. travel agents, KAPAgri) to understand their pricing structures. Develop in-house chemistries and protocols to lower costs of generating data | <ul style="list-style-type: none"> Commission a study to develop an energy saving strategy for the ARC. This should have been completed by now. Implement a plan to get ARC off the electricity grid and fund it, it will require capital expenditure, but will realise a significant amount of funding for other operations. Implement the coordinated bulk-buying project for research consumables. Exploit ICT for virtual delivery of scientific services where possible |
| 8 | COVID-19 | <ul style="list-style-type: none"> Implement the ARC Pandemic Management Plan Increase awareness about the pandemic | <ul style="list-style-type: none"> Implement the ARC Pandemic Management Plan. Increase awareness about the pandemic. Use remote working arrangement where possible. |

| EXTERNAL ENVIRONMENT – OPPORTUNITIES | | | |
|--------------------------------------|--|---|--|
| No. | Opportunities | What about the opportunities must be mitigated for the remainder of 2020/21? | What about the opportunities can be mitigated in 2021/22? |
| 1 | Exploitation, marketing and commercialisation of products, services and marketing of our IP. | <ul style="list-style-type: none"> Develop aggressive branding and marketing plan for existing services and products through print and electronic media and social platforms. Sell breeder and certified seed, diagnostic and analytical services. Plan full commercialisation of processed (vegetables, medicinal plants, fruit and wine) products. Finalise an agreement with Winetech on climate change research. Engage DBSA on green climate fund. Finalise all pending license agreements. Identify, develop and finalise projects that can be spun off in 2020/21 Identify key products that can be sold, service products and infrastructure Develop manuals and research reports for dissemination in the country and region. | <ul style="list-style-type: none"> Existing products and services for new SADC markets. Implement commercialisation plan of processed (vegetables, medicinal plants, fruit and wine) products. Expand Winetech initiative to other commodity groups. Growing the external revenue through improved stakeholder relations. Include animal products as well. Marketing and commercialisation plans that will drive the ARC towards the future are long overdue. Decisions in this regard was taken five years ago and yet no real progress is made. ARC should develop a business attitude with urgency. |
| 2 | Focussed revenue generation strategies using physical assets. | <ul style="list-style-type: none"> Finalise the review and revenue generation strategies and plans. Consolidation of the physical assets of the ARC. Finalise the consolidation of operational structure consolidation. All available land to be put in production. Dispose surplus stock/assets and produce. Investigate active revenue generation methods. Diversify product portfolio to attract new funders and identify new niche markets to offer services i.e. food industry for pathogen profiling and quality assurance. | <ul style="list-style-type: none"> Implement strategy and consolidation plans. Full comprehensive roll out of the operational plans. Review business models for services and laboratories. |
| 3 | Diagnostic services to added disease outbreaks. | <ul style="list-style-type: none"> Resolve billing issues at OVR. Aggressively market the ARC to increase its visibility. Articulate ARC capabilities. Generate revenue from analysis and diagnostics. | <ul style="list-style-type: none"> Consolidate all diagnostic competencies virtually. Articulate ARC capabilities. Generate revenue from analysis and diagnostics. Initiate sensitization and marketing of FMD vaccine to be produced from new factory |
| 4 | Exploit local and international opportunities and expand on leadership footprint in advanced sciences to become the partner of choice. | <ul style="list-style-type: none"> Identify the key thematic areas where we have an advantage. Identify champions for those areas and develop a work plan and strategy for next five years. Identify areas where we can become centres of excellence. Align to the international relations strategy. | <ul style="list-style-type: none"> Implement the plan. International relations strategy. Marketing strategy. Create an Agriculture University in partnership with one/several universities in SA. Focus on postgraduate qualifications and develop this university in way with a business model that will ensure ARC benefit from incentives for graduates and publications and can leverage the investment in the PDP in an income generation model for the ARC. E.g. ARC invests x millions in student bursaries, how do we engage the Department of Higher Education to develop a model that incentivise the ARC further. |
| 5 | Potential to become regional agricultural hub. (Part of International opportunity) | <ul style="list-style-type: none"> Identify regional collaborative partners. | <ul style="list-style-type: none"> Establish regional bilaterals and collaborations. Exploitation of reference laboratories. Establish an agricultural innovation hub in the Roodeplaat campus of the ARC. Developing a strategy and implementation plan to establish an Agricultural research, innovation and incubation centre. |

| EXTERNAL ENVIRONMENT – OPPORTUNITIES | | | |
|--------------------------------------|---|---|---|
| No. | Opportunities | What about the opportunities must be mitigated for the remainder of 2020/21? | What about the opportunities can be mitigated in 2021/22? |
| 6 | Capacity development with local and continental partners. | <ul style="list-style-type: none"> Coordinate an agricultural planning service. Concentrate on distressed farms and new black entrants. | <ul style="list-style-type: none"> Pursue a relationship with Agrinatura to explore areas of cooperation and capacity development using ARC infrastructure. Become a regional training centre of choice. Enter into strategic partnership with institutions involved in capacity building in the agricultural sector. Establish agricultural University in the ARC. Refer to comments made above. |
| 7 | High demand for agricultural services. | <ul style="list-style-type: none"> Deliberate, aggressive marketing of ARC at conferences, stakeholder meetings – using research reports from campuses. Urgently review pricing and operational structures. | <ul style="list-style-type: none"> Dedicated marketing showcasing capabilities. Establish coordinated sample receiving/testing one-stop centres. Become centre of choice for diagnostic and analytical services. Establish coordinated sample receiving/testing one-stop centres. Part of coordinated diagnostic services. Accreditation of the ARC laboratories with SANAS |

| INTERNAL ENVIRONMENT – WEAKNESSES | | | |
|-----------------------------------|---|--|---|
| No. | Weakness | What about the weakness must be managed for the remainder of 2020/21? | What about the weakness must be managed in 2021/22? |
| 1 | Insufficient commercial acumen and marketing and sales skills in proposal responses | <ul style="list-style-type: none"> Review commercialisation strategy and develop database of technologies to be commercialised. Comprehensive review of proposals/business plans before implementation. Involve all role players (finance and commercialisation) in the planning process. Expand commercialisation capacity of the ARC to full exploit commercialisation opportunities. | <ul style="list-style-type: none"> Capacitate commercialisation and marketing pipeline within the ARC. Increase the commercialisation capacity in ARC. Establish financial viability of commercialisation of technologies. Appoint people with business acumen that understand how businesses must operate and who can instil and lead the business culture within the organisation Train and reskill researchers and all managers in the ARC. Many have been trained as scientists and the business and marketing and commercialisation skills must be added. Develop change management programmes to ensure ARC functions as a business. Change the mind-set of the entire ARC, including employees in the support side of the business to work and act like business people. When we deliver good quality and market and make these known, we will retain and attract clients. |
| 2 | Inadequate marketing management. | <ul style="list-style-type: none"> Appoint dedicated marketing and stakeholder relations resource. Prioritise high-level engagements with key stakeholders. Immediately engage with the Commodity Trusts (Maize Trust, Winter Cereal Trust, Hortgro, Winetech, PRF, OPOT, PSA, RPO, Milk SA, NERPO etc.). Engage with DALRRD and other Government departments (e.g. DSI, DEA, DTI, PDA's, IDC, ECDC, AfricaBio, etc.) considering ARC's financial situation. | <ul style="list-style-type: none"> Establish marketing strategy and stakeholder management plan. Rebranding of the ARC and its products. Have succession plans that are actively monitored and link to an internal promotion strategy. Implement the post retirement and mentoring strategy. |
| 3 | Inadequate stakeholder management. | <ul style="list-style-type: none"> Immediately engage with the Commodity Trusts (Maize Trust, Winter Cereal Trust, Hortgro, Winetech, PRF, OPOT, etc.). Engage with DALRRD and other Government departments (e.g. DSI, DEFF, DTIC, PDA's, IDC, ECDC, AfricaBio, etc.) considering ARC's financial situation. | <ul style="list-style-type: none"> Continuation of engagements with DALRRD and other Government departments (e.g. DSI, DEFF, DTIC, PDA's, IDC, ECDC, AfricaBio, etc.) considering ARC's financial situation. Continuation of engagements with the Commodity Trusts (Maize Trust, Winter Cereal Trust, Hortgro, Winetech, PRF, OPOT, PSA, Cotton SA, Tobacco Industry) Increased and active identification of private partners who might want to partner with ARC, e.g. pharmaceutical companies, food and beverages companies, etc. |
| 4 | Aging work force, inadequate succession planning and lack of critical mass. | <ul style="list-style-type: none"> Finalise Skills Roadmap, consolidation of operational structures. Develop backup plans for all strategic/critical positions in the ARC (facilitated by HR). Prioritise the implementation of the equity and transformation committee at Institutes. Communicate the importance of succession planning to all ARC staff. Targeted recruitment of skilled workforce. Redeployment/reskilling existing personnel where relevant. | <ul style="list-style-type: none"> Roll out the identified actions and measure impact on business. Develop a policy for integrating PDPs into vacant positions. Establish internal and external collaborations. Implement the ARC succession plan |
| 5 | Ageing infrastructure. | <ul style="list-style-type: none"> Identify reliable equipment that can be shared. | <ul style="list-style-type: none"> Prioritisation of Capex at an organisational level. Dispose of obsolete equipment. Conduct infrastructure audit |

| INTERNAL ENVIRONMENT – WEAKNESSES | | | |
|-----------------------------------|--|---|--|
| No. | Weakness | What about the weakness must be managed for the remainder of 2020/21? | What about the weakness must be managed in 2021/22? |
| 6 | Limited synergy between business units/working in silos. | <ul style="list-style-type: none"> Establish a multidisciplinary team to develop a project rationalisation matrix. Consolidate programmes/discontinue unjustifiable projects. Identify excess capacity and skills that can be shared/reassigned across the organisation. | <ul style="list-style-type: none"> Adopt a multidisciplinary research team approach. Create a skills database that can be regularly updated. Institute and incentivise a programme approach. Joint project development |
| 7 | ARC processes are not technologically advanced. | <ul style="list-style-type: none"> Identify areas for automation of internal processes. | <ul style="list-style-type: none"> Automate and streamline critical internal processes. |

| INTERNAL ENVIRONMENT – STRENGTHS | | | |
|----------------------------------|---|--|--|
| No. | Strength | What about the strength must be leveraged for the remainder of 2020/21? | What about the strength must be leveraged in 2021/22? |
| 1 | Local and internationally recognised expertise. | <ul style="list-style-type: none"> Identify relevant expertise. Attract high level scientific skills. Reposition our programmes in which we have an advantage. Identify the key thematic areas/competencies where we have an advantage/can become centres of excellence Identify champions for those areas and develop a work plan and strategy for next five years. Align to the international relations strategy (e.g. BRICS forum for agriculture research). Foster local and international collaboration. | <ul style="list-style-type: none"> Implement aligned strategy. Establish and maintain international collaboration agreements. Collaborative fundraising. Participate in multinational, multi-stakeholder consortiums. Profile ARC experts. |
| 2 | Capacity to train post-graduate students. | <ul style="list-style-type: none"> Engage with DSI and NRF on ARC capability Engage with the Chinese embassy to understand their current surge in funding ARC employees and students. | <ul style="list-style-type: none"> Pursue a relationship with Agrinatura to explore areas of cooperation and capacity development using ARC infrastructure. Establish an agricultural university. |
| 3 | Research offers relevant, practical, and responsive solutions in the national interest. | <ul style="list-style-type: none"> We need to develop our expertise before we try to sell ARC Deliberate, aggressive marketing of ARC at conferences, stakeholder meetings – use research reports from campuses. Market ARC programs to the drivers of national programs. | <ul style="list-style-type: none"> Market ARC capabilities at all possible platforms, using constantly updated research reports. Improve visibility of ARC programs in provinces and national departments. Align our research priorities to the emerging small holder farmers |
| 4 | Assets and infrastructure availability. | <ul style="list-style-type: none"> Use available unused land and buildings to generate income. Using ARC website and social media resources to advertise products and services. | <ul style="list-style-type: none"> Implement the asset management plan and sell assets that are not required. |
| 5 | Ability to predict, identify and prevent pests and disease outbreaks. | <ul style="list-style-type: none"> Develop internal emergency response plans. Communicate the response plans. Revive regular meetings with DALRRD on disease pests. | <ul style="list-style-type: none"> Implement, evaluate, and reassess the strategy. |
| 6 | Develop Resilience models and technologies/ knowledge that can be applied, to the country, region and continent in relation to climate and other agriculture risks. | <ul style="list-style-type: none"> Identify, recommend, and participate in national, regional, and international forums promoting resilience. | <ul style="list-style-type: none"> Build our capacity to become the partner of choice and to access funding. |
| 7 | Clear strategic mandate. | <ul style="list-style-type: none"> Communicate ARC mandate to all ARC staff. | <ul style="list-style-type: none"> Position ARC as the 'go to' organisation for Government regarding funded agri-R&D |

UPDATED PESTEL ANALYSIS – INFORMING 2021/22 PLANNING

The PESTEL Analysis presented in the ARC Strategic Plan (2020/21 – 2024/25) was reviewed and updated as follows:

| POLITICAL ANALYSIS | ECONOMIC ANALYSIS | SOCIAL ANALYSIS |
|--|--|--|
| <ul style="list-style-type: none"> Land reform. Changes in national political context, as well as changes in SADC neighbouring countries. National Development Plan and other government programmes. Departments with overlapping mandates (e.g. DEFF) and the need for alignment and cooperation. Foreign trade relations uncertainty (trade dynamics with EU, AU, USA, China etc.). BRICS and the realignment of agricultural institutes within BRICS. Social grants dynamics, including special pandemic relief grants. Political stability in the SADC region and the rest of the continent. Out of these, the resent tensions with Zimbabwe governing party, is exacerbated by the new disaster border crossing restrictions/regulations. Changes in international geo-politics and the impact of the Covid-19 pandemic on trade and scientific collaboration Impact of Covid-19 on the global and national political spheres, inclusive of government interventions such as national state of disaster, travel restrictions between countries, redeployment of resources globally towards finding solutions, labour and employment and business rescue challenges globally and nationally. Increasing political tensions in South Africa and neighbouring countries | <ul style="list-style-type: none"> Capability of SHF to participate in commercial agriculture. Market access for SHF including infrastructure development. Competitiveness of commercial agriculture. Global economic fluctuations including price fluctuation of commodities. The exchange rate and its impact on trade. Tariff and non-tariff trade barriers. African Continental Free Trade Agreement ARC access to funding. National strategies and imperatives. Energy, food and water security. Public health implications from pests and diseases (e.g. Covid-19, zoonotic diseases). Fourth, fifth and sixth industrial revolution. Corporatisation – vertical integration. Credit rating downgrade. Social grant bill increases. Increase in VAT. Trade wars. Economic recession/stagnation. Increased intensity of competition and active drives to decrease ARC funding from DALRRD and DSI. Impact of Covid-19 on the global, regional and national economy Increased competitiveness of the agricultural sector. Agriculture is a key driver of the SA economy, yet agricultural research is not prioritised as a priority by the various relevant departments of the country and increased cuts in budget has negative effect on ARC ability to contribute to the economic welfare of the country in the future. Immediate impact might not be visible. Implementation of circular economic development initiatives | <ul style="list-style-type: none"> Social inequalities, including gender, race and ethnic disparities. Levels of skills and education in society. National standards of living. Levels of unemployment. Extent of reliance on social grants. Food and nutritional safety and security. Urbanisation. Population dynamics. Social cohesion and resilience. Health and safety dynamics - especially in the light of the Covid-19 pandemic. Interest in and support to agriculture as a profession. Farm consolidation and concentration. Political unrest interfering with research activities. Changing consumer preferences. Impact of Covid-19 on the social stability of countries worldwide and increased poverty and unemployment resulting in increased hunger and malnutrition. |

| TECHNOLOGICAL ANALYSIS | ENVIRONMENTAL ANALYSIS | LEGAL/REGULATORY ANALYSIS |
|---|---|--|
| <ul style="list-style-type: none"> Increased multidisciplinary nature of science and technology. Impact of social media platforms. New technology applications in agriculture, e.g. drones, gene editing, automated hydroponics infrastructure. Rate of technology adoption (diffusion curves). 5th Wave (move from knowledge to conceptual era). S-curves (analysis of skills, knowledge and technology). Emergence of artificial intelligence. Cost of technology. Big data analytics in agriculture Smart agriculture 4th Industrial Revolution (4IR) Emergence of Circular agriculture and Agro-ecology movements Interactive software applications based on smart devices Covid-19 resulted in increased use of virtual platforms for many business processes, stakeholder management; research; diagnostics; training; advisory services, etc. New technologies such as use of drones and satellite imaging for monitoring of research trials, commercial plantings and data capturing can increase research outputs | <ul style="list-style-type: none"> Impacts of climate change and climate variability on agricultural production. Shifting production regions Competing land use priorities (mining activities, urban development, etc.). Increased incidences of natural disasters due to climate change e.g. veld fires, heat waves and drought. Availability of arable land. Energy mix and availability with emphasis on renewables. Waste management and its implications for agriculture. Environmental pollution and bio-magnification e.g. neonicotinoids. Sustainable use of natural resources. Access to clean water. Pest and disease outbreaks. Threats to bio-diversity. Greenhouse gases because of population growth in people, animals, etc.). Resilience in agriculture production. Covid-19 positive and negative effects on the environment and climate due to movement restriction and a significant slowdown of social and economic activities, air quality has improved in many cities with a reduction in water pollution in different parts of the world; however; death and pollution due to medical waste and protective clothing will have a long-term effect | <ul style="list-style-type: none"> Changes to legislative mandate. Biodiversity regulatory system. Regulatory permits system (e.g. GMO Act and release of biological control agents, Cannabis). Intellectual property regulations and new national IP policy. Phytosanitary and public health (e.g. zoonotic disease) regulations. Scientific and technical support for effective regulatory compliance. Competition regulation. Property (immovable) regulations. Changes in labour legislation. Impacts of other national policies/statutes/treaties (e.g. Medicines Control Act, etc.). International trade laws and regulations. Land reform regulations Lack of regulations in testing and evaluation of agricultural machinery and equipment's New uncharted territory in terms of animal disease investigation and regulatory activities that require physical inspection for certification of disease status |

UPDATED STAKEHOLDER ANALYSIS – INFORMING 2021/22 PLANNING

The Stakeholder Analysis (not in any order of priority) presented in the ARC Strategic Plan (2020/21 – 2024/25) was reviewed and updated as follows:

| KEY STAKEHOLDER | LESSONS LEARNT TO DATE | WHAT DO WE DO TO STRENGTHEN THE RELATIONSHIP GOING FORWARD? |
|---|--|---|
| Critical government departments: <ul style="list-style-type: none"> DALRRD DEA DEFF DoE DoH DSI DTIC DHET AgriSETA Provincial Departments of Agriculture and related SOE's | <ul style="list-style-type: none"> Lack of understanding of ARC's mandate and competencies. Some exploit our generosity. Often have unrealistic expectations in terms of time frames. Lack of engagement on trade initiatives. DALRRD: Poor relations at higher levels. Good relations at lower level. | <ul style="list-style-type: none"> Propose formal standing arrangements. Renegotiate MOU's and SLA's. Improve our engagement with key stakeholder on the bio-economy strategy and the Agriculture and Agro-processing Master Plan (AAMP). Stricter enforcement to contractual agreements. Need to join their forums or committees; e.g. Food sustainability forum, Technology centres for DSI. Need to be invited and attend their planning sessions. |
| Portfolio Committee | <ul style="list-style-type: none"> High and unrealistic expectations for delivery. Lack of understanding of ARC's mandate and competencies. Limited support from shareholders. | <ul style="list-style-type: none"> Try to influence and align with their priorities. Regularly invite them to the ARC campuses for visits and presentations. Invite them to visit ARC developmental projects in the communities. |
| Council | <ul style="list-style-type: none"> Making it their priority to understand the business of ARC. | <ul style="list-style-type: none"> Ensure they remain participative. Clear and better articulation of impact of our work. |
| Commodity groups/Trusts/Associations: <ul style="list-style-type: none"> Grains (wheat, barley, maize, sorghum, oil seed) Potatoes and vegetables Deciduous fruits Citrus Culdevco Winetech SANSOR Maize Trust, Winter Cereal Trust, PRF, OPOT, Hortgro, etc.) Cotton SA, Tobacco industry Cannabis and medicinal plant industries inclusive of regulatory bodies e.g. SAPHRA South African Agricultural Machinery Association South African Biogas Industry Association Red Meat producers Organisation (RPO) National Emergent Red Meat Producer Organisation Milk SA Livestock Breeders Societies | <ul style="list-style-type: none"> Losing status as preferred partner. Gradually disinvesting in ARC and setting up competition for the ARC as well as claiming that the ARC is the one disinvesting. Grains: Resistance to transformation of the sector. Expectation of free or subsidised services from ARC. In instances do not understand our mandate with respect the Registrar. Potatoes and vegetables: Exclusion from processes to create "vegetable SA". Expectation of free or subsidised services from ARC. | <ul style="list-style-type: none"> Improve relationships at strategic level. Propose formal standing working arrangements with these groups. Improve how we brand and market ARC products and services. Ensure that agreements reflect IP ownership. Aggressive marketing of the ARC brand |
| Funding agencies, local and International | <ul style="list-style-type: none"> South Africa is not a priority for international agricultural development. Unstructured and uncoordinated responses to funding calls. Perceived poor performance of ARC researchers. Money follows researchers. Dictating the research agenda. | <ul style="list-style-type: none"> Establish an office to coordinate our response to funding opportunities, particularly international opportunities. High level engagement with the funding agencies. |

| KEY STAKEHOLDER | LESSONS LEARNT TO DATE | WHAT DO WE DO TO STRENGTHEN THE RELATIONSHIP GOING FORWARD? |
|---|--|---|
| Tertiary institutions | <ul style="list-style-type: none"> Exploitation of ARC expertise, time and capacity. Reluctant to share the post-graduate student subsidy. Benefit of relationship skewed against the ARC. Our relationship is becoming competitive and parasitic. | <ul style="list-style-type: none"> Develop formal strategic partnerships with tertiary institutions. Use MoUs to guide working relationship and funding models. Continuous engagement with the Department of Higher Education and universities. Revise contracts i.t.o. benefit sharing/post-graduate student subsidy and recognition. Clarify mandates to prevent territorial battles. Re-institute the collaboration centres and develop a longer-term partnership with more investment from universities and in which the ARC could benefit from incentive funding. Also involve the industries above in these initiatives. |
| Service providers and commercialisation partners, e.g. Hortec, Hydrologic, SAWS | <ul style="list-style-type: none"> Most of the older agreements make for long term relationships that are negative to the ARC and are also non-compliant to the IPR-PFRD Act⁴². Plan to offer same service in the climate space. | <ul style="list-style-type: none"> Review the agreements. Publicly advertise all IP available for commercialisation. Consider forming partnerships where possible. |
| Science Councils (e.g. CSIR, MRC, HSRC) | <ul style="list-style-type: none"> Encroaching mandate. | <ul style="list-style-type: none"> Collaborate on projects of mutual interest. |
| Commercial clients | <ul style="list-style-type: none"> Commercial farmers feeling neglected by ARC. | <ul style="list-style-type: none"> Arrange targeted interventions with key commercial clients. Showcasing of ARC capabilities in major agricultural events. Increase public-private partnerships. Develop inclusive marketing strategy aimed at valuation of all relationships and stakeholders – use case studies to tell the success stories. |
| Private research companies | <ul style="list-style-type: none"> Developing competitive technologies using ARC IP. ARC not responding/innovating in a highly competitive and fast developing industry. | <ul style="list-style-type: none"> Develop capacity and skills to ensure ARC is a player of choice across the value chain of new technology development. Improve ARC ability to commercialise and market services. |
| Employees | <ul style="list-style-type: none"> Not fully engaging on strategic imperatives. In denial and complacent about the ARC's financial status. Demoralised about the organisational status. IP violations. | <ul style="list-style-type: none"> Regular communication about the ARC financial situation. Engage employees on the importance of IP protection and consequence management for violations. Establish more engagement forums, and other means of engagement (e.g. monthly or quarterly newsletters). Actively drive the commercialisation strategy of the ARC and Implement the incentive system. Demonstrate and articulate value system on a daily basis. Reward and recognize innovation in different ways Acknowledge the sacrifices, commitment and loyalty being made by employees when appropriate. |
| Beneficiaries/Communities | <ul style="list-style-type: none"> Unrealistic expectations of the ARC. | <ul style="list-style-type: none"> Clearly defined terms of engagement. Long-term relationships and continued learning and support. |
| Food retail sector | <ul style="list-style-type: none"> Niche market for disease diagnostic profiling and quality assurance. | <ul style="list-style-type: none"> Engage with them to identify their needs and market ARC capabilities. Devise an action plan and appoint a champion to lead |

⁴²The **Intellectual Property Rights from Publicly Financed Research and Development Act**. Available: <https://www.dst.gov.za/images/pdfs/IPR%20Act%20of%202008.pdf>



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