



ARC • LNR

Excellence in Research and Development

AGRICULTURAL RESEARCH COUNCIL

ANNUAL PERFORMANCE PLAN

2023/24





AGRICULTURAL RESEARCH COUNCIL

ANNUAL PERFORMANCE PLAN

FOR

2023/24

EXECUTIVE AUTHORITY STATEMENT

The mission of the ARC is to conduct research, develop partnerships and human capital, and foster innovation for a sustainable agriculture sector. The intended outcome is sustainable agricultural systems for agrarian transformation and food and nutrition security. The ARC has defined its outcomes for the period 2020 - 2025, which direct its strategic focus and inform the outputs of this Annual Performance Plan towards:

1. Increased agricultural production and productivity;
2. Sustainable ecosystems and natural resources;
3. Improved nutritional value, quality, and safety of agricultural products;
4. Skilled and capable agricultural sector;
5. Enhanced resilience of agriculture; and
6. A high-performing and sustainable organisation.

The APP complies with the guidelines provided by National Treasury and the Department of Monitoring and Evaluation. The Department of Land Reform and Rural Development (DALRRD) focuses on the National Priorities to achieve related outputs. The 2023/24 Annual Performance Plan has notable alignment with the following national priorities:

- Economic transformation and job creation;
- Education, skills and health;
- A capable, ethical and developmental state;
- Spatial integration, human settlement and local government; and
- A better Africa and the world.

Completing the Institutional Review of the ARC was a significant development during 2022. The recommendations will require several projects, initiatives, and specific actions to be implemented to realise some of the envisaged strategic benefits and operational efficiency gains.

Using the outputs of its research projects, the ARC has positioned itself to continue making a meaningful contribution to the Agriculture and Agro-Processing Master Plan (AAMP) led by DALRRD by providing necessary scientific solutions for growth, transformation, employment creation, and other developmental challenges in the agri-food environment. There is also a renewed focus on improving the integration of socio-economic aspects in ARC's research initiatives.

This APP is presented in terms of the Agricultural Research Act, 1990 (Act No. 86 of 1990, as amended by Act No. 27 of 2001) and the Public Finance Management Act, 1999 (Act No. 1 of 1999, as amended by Act No. 29 of 1999). The APP considers relevant policies, legislation, and other mandates for which the ARC is responsible. It also accurately reflects the strategic outcome-orientated goals and objective which the ARC will endeavour to achieve.

I hereby endorse the APP developed by the Council of the Agricultural Research Council, under the guidance of Ms J Isaacs, Chairperson of the Council.

Ms. A.T Didiza, MP

MINISTER: Agriculture, Land Reform and Rural Development

ACCOUNTING AUTHORITY STATEMENT

The ARC Council has accepted the outcomes and recommendations of the Institutional Review of the ARC and has requested management to prepare an implementation plan for the next five (5) years to ensure that the organisation reflects on, learns from, adapts to, and adjusts to, based on the review.

The review recommendations (18) and actions (144) were plotted. Many overlaps were discovered, necessitating a further review based on elements of systems thinking and evidence-based management. A qualitative methodological approach known as the Gioia Methodology was used for data analysis, resulting in the development of a data structure that linked the review recommendations. Five (5) main thematic areas emerged:

- Revitalising partnerships and stakeholder engagements
- Towards a “ONE ARC”
- Lead National and Regional agriculture research agenda
- Organisations re-design and business process enhancement
- Pursuing sustainability and making it work.

Each of the main thematic action areas was unpacked through the development of diagrams and presented in the form of mind maps, which capture each thematic action area with the key supportive foci for achieving the thematic action areas. These key supportive foci will form the basis on which key performance indicators (KPIs) and other measurable targets with actual performance will be measured and reported.

Revitalising partnerships and stakeholder engagements

Stakeholder relations management was highlighted as a key undertaking last year and will continue going forward, as highlighted in the institutional review. Below are three (3) examples of engagements – South Africa, Africa, and international- to confirm the ongoing endeavours.

Domestic

National Beef Performers Awards

The ARC recently hosted the annual National Beef Performers Awards virtually, where the CEO delivered a keynote address. This was another opportunity for the ARC and its leadership to present a commitment to advancing the industry and being a formidable science and technology partner. The farmers that were recognised are the best performers in the sector and perhaps on the entire content in terms of adoption and use of science and technology in their farming enterprises. As usual, the event was supported by industry partners, confirming the need for the ARC to continue hosting such events.

Africa

Capacity Development in Cabo Delgado with DIRCO and DALRRD

The ARC is supporting the Department of International Relations and Cooperation's (DIRCO) African Renaissance Fund to support the development of the agriculture sector in the Cabo Delgado Province of Mozambique. The objective is to assist internally displaced persons (IDPs) in regaining their livelihoods through agricultural production. ARC input includes both technical as well as project management and logistics-oriented aspects. Under very challenging circumstances, the ARC managed to get a significant number of inputs to the project site over the holidays in time for the planting season. This positions the ARC as a very reliable partner and opens opportunities of a similar nature, as already indicated in interactions with DIRCO and DALRRD.

International

Science at the US-Africa Leaders' Summit

The ARC hosted an agriculture session in partnership with the International Science Council (ISC) along the margins of the US-Africa Leaders' summit on 14 December 2022 in Washington DC as part of a series of events under "Science at the US-Africa Leaders' Summit." The CEO delivered the keynote address titled 'Science for climate-resilient food systems in Africa' at the hybrid seminar. His address highlighted the ARC's key achievements in advancing climate-resistant food systems and the need for accelerating agricultural science on the continent. Other speakers were two ARC scientists and speakers from Ghana, Kenya, and the USA. The session contributed to the Summit's shared values to promote food security and respond to the climate crisis. This session increased the ARC's visibility in the US and enabled discussions with other organisations in the US and beyond. An expected outcome from the science engagement is a declaration finalized for sharing with US Congress and the possibility of one of the Congressmen visiting ARC later in 2023.

Towards a "ONE ARC"

The spatial orientation of the ARC campuses requires consolidation in terms of infrastructure and assets. The ARC is working towards consolidating the Pretoria campuses, but this process requires understanding biological processes and biosecurity measures.

The communication and marketing strategy approved by Council will also enhance the branding of a 'ONE ARC.'

The Vision 2050 strategy will be revised with the review recommendations, the economic and environmental changes, and especially the impact of the Climate Change Emergency on the agricultural sector. So, in essence, the research strategy will enhance and strengthen the combined outcomes of the ARC and its stakeholders.

Lead National and Regional agriculture research agenda

Climate Change Emergency

Council has promoted a more integrated research view to recognise the overarching impact of the Climate Crisis at both local and global levels. The APP highlights the extent and scope of the Climate Change Emergency in South Africa.

The ARC will celebrate the UN Year of the Millets by showcasing its research efforts and technologies. Great strides have been made with the construction of the FMD vaccine facility. The required service providers were appointed, and the development of the vaccine process resulted in FMD vaccine doses being produced and made available to DALRRD.

Organisations re-design and business process enhancement

Several challenges in terms of business process enhancement and people management were started in the last financial year. The institutional review will give further impetus to this work, but it would be remiss in highlighting some achievements.

A Supply Chain Management turn-around was designed and accepted by Council to ensure that the severe challenges to implementing research projects can be addressed.

The Top Employer Institute concluded an external assessment of the HR systems, resulting in the ARC being recognised as one of the Top Employers in South Africa. The results are based on six domains that cover key HR themes: Steer (98,27%), Shape (95,02%), Attract (87,85%), Develop (90,02%), Engage (85,68%), and Unite (84,17%). The percentages indicate the work and effort required to enhance HR performance in the ARC.

Pursuing sustainability and making it work.

The ARC remains under financial pressure, so sustainability is critical to the many actions required by law, stakeholders' expectations, and the ARC's dual mandate. Several plans are afoot to address key concerns and priorities as contained in the IR outcomes and various independent assurance processes. These fundamental concerns emanate from the reviewed ARC strategic risk register, with a specific focus placed on a) Staff development and retention with an emphasis on succession planning, coaching, and mentoring; b) Infrastructure and maintenance with an emphasis on occupational health and safety and the national goods assets and laboratories.

The ARC must work for the agricultural sector, and the road ahead will be difficult, and hard choices will have to be made. To the 'new' CEO and the Executive management team, thank you very much for leading the ARC toward a new strategic position. Your efforts are greatly appreciated.

On behalf of Council, I would also like to thank the staff of the ARC for your hard work, which has brought outstanding results and outputs.

Thank you to all the stakeholders who maintained a positive working relationship with the ARC. Council appreciates your commitment and invites you to continue working with us, for the ARC, with the ARC for the agricultural sector.



Ms. Joyene Isaacs

Chairperson of Council

AGRICULTURAL RESEARCH COUNCIL

CHIEF EXECUTIVE OFFICER AND PRESIDENT STATEMENT

On behalf of the Senior and Executive Management of the Agricultural Research Council (ARC), I present the Annual Performance Plan (APP) for the financial year 2023/24, covering the period from 01 April 2023 to 31 March 2024. This APP is presented in terms of the Agricultural Research Act, 1990 (Act No. 86 of 1990, as amended by Act No. 27 of 2001¹) and the Public Finance Management Act, 1999 (Act No. 1 of 1999, as amended by Act No. 29 of 1999²). This is the first APP with the new President & CEO, and CFO, who joined the ARC during the financial year 2022/23. In that regard, the ARC is in a leadership transition which is important to note as it accompanies a significant number of highly critical initiatives aimed at redirecting and repositioning the ARC as the country's premier agricultural research institution.

The mission of the ARC is to conduct research, develop partnerships and human capital, and foster innovation for a sustainable agriculture sector. The intended outcome is sustainable agricultural systems for agrarian transformation and food and nutrition security. Informed by its mission and aligned to the MTSF priorities³ and outcomes, the Agricultural Research Council has defined its outcomes for the period 2020 - 2025, which direct its strategic focus and inform the outputs of this Annual Performance Plan towards:

1. Increased agricultural production and productivity;
2. Sustainable ecosystems and natural resources;
3. Improved nutritional value, quality, and safety of agricultural products;
4. Skilled and capable agricultural sector;
5. Enhanced resilience of agriculture; and
6. A high-performing and sustainable organisation.

It is against these outcomes that the ARC's Mid-Term Review Report was prepared. The Mid-Term Review Report used the beginning of 2019/20 as the baseline and covered the period until September 2022, the halfway point in the five-year strategic planning cycle. Reflecting on this period, the ARC has continued to focus on generating knowledge and developing technologies to positively contribute to improved food security and support the agricultural sector's competitiveness. The audited 5-year trend analysis shows that the Research and Development divisions achieved the second-highest performance over the past five years, reaching 77% of targets for the past year. The generation of knowledge and appropriate technologies to support and improve production and productivity are central to the work of the ARC. This period incorporates a very challenging period brought about by the COVID-19 pandemic, where operations were affected significantly due to lockdowns and travel restrictions, significantly slowing down economic growth and affecting many projects. The impact on projects involving external partners was felt widely across the organisation. As the world slowly emerges from that major setback, it is important to refocus energies towards catching up on delayed projects and regaining lost ground.

Using the outputs of its research projects, the ARC has positioned itself to continue making a meaningful contribution to the Agriculture and Agro-Processing Master Plan (AAMP) led by DALRRD by providing necessary scientific solutions for growth, transformation, employment creation, and other developmental challenges in the agri-food environment. Providing critical technical support in developing the AAMP, the ARC technology development, and scientific innovation will further support the AAMP objectives by enabling improved agricultural productivity and reducing post-harvest losses for national and household food security. Initiatives aimed at protecting plant and animal health, as well

¹ Available: <https://www.arc.agric.za/Documents/Agricultural%20Research%20Act%20%2086%20of%201990.pdf>

² Available: <http://www.treasury.gov.za/legislation/PFMA/act.pdf>

³ Available: <https://www.dpme.gov.za/keyfocusareas/outcomesSite/Pages/mtsf2021.aspx>

as the sustainability of the environment, are integrated with this research work. There is also a renewed focus on improving the integration of socio-economic aspects in ARC's research initiatives.

One of the key strategic projects that will also be progressed during the financial year is the Foot and Mouth Disease (FMD) vaccine production facility project. FMD vaccine production has a long history at the ARC, with the original facility having discontinued operations more than 10 years ago. The current project will resuscitate production and has a strong capacity development initiative to assist the country and the region with the much-needed vaccine. The unavailability of FMD vaccine production capacity renders the country and its neighbours vulnerable to debilitating outbreaks. With designs being finalised, the facility construction will likely commence in this financial year.

Beyond the FMD vaccine production facility, optimisation of the property portfolio will be an ongoing priority area to have a clearly articulated business plan for each of the ARC's properties. The numbers are being revisited, and initiatives include options such as disposal, cost sharing, and the use of specialists for specialised functions. This approach is being overlayed with the Commercialisation Strategy, where some of these options receive further expatriation, even though the primary focus is on the outputs of research and development efforts. Elements of the strategy will ensure that the value of IP products is maximised and exploitation of its commercial value is optimised.

In driving all these projects, the organisation needs to remain sustainable. The metrics established in the ARC Financial Sustainability and Turnaround Plan continue to be monitored and evaluated for impact at all levels of business operations. This includes several efficiency-focused initiatives to unlock bottlenecks across critical areas of the organisation. One of the key efficiency projects being implemented focuses on improving the Supply Chain Management (SCM) environment. Inefficiencies in SCM affect all areas of the organisation, both core and support areas. Initiatives implemented during 2022/23 have already begun to yield results and ease pressures while legacy issues are receiving priority. Keeping this initiative in the spotlight is essential for a more capable and agile organisation.

Completing the Institutional Review of the ARC was a significant development during this period. This is a legislated process that takes place every five years, where a panel of domestic and international experts assesses various aspects of the organisation for relevance, effectiveness, and efficiency. The recommendations will require several projects, initiatives, and specific actions to be implemented to realise some of the envisaged strategic benefits and operational efficiency gains. Amongst others, these include:

- Better alignment of the strategy with the ARC mandate;
- Entrenching multidisciplinarity;
- Inclusivity and transformation in research programmes;
- Driving a positive organisational culture;
- Designing a fit-for-purpose organisational structure; and
- Enhanced risk management.

Action plans are being refined to meet these recommendations, and the ARC Council is supporting Management to ensure these are implemented within reasonable timelines. A more important consideration is the integration of the implementation of these initiatives with the Financial Sustainability and Turnaround Plan. This integration will streamline monitoring and reporting requirements and incentivise participation by the staff of the ARC in implementing these change initiatives.

Change management will be essential to ensure that ARC staff remain engaged during the significant changes being introduced in the organisation. The principle of integrating change initiatives will reduce and avoid fatigue that comes with multiple initiatives and reporting requirements as well. Other initiatives associated with positively impacting ARC culture will receive attention in the medium term. A culture survey will also be scheduled to create an opportunity to better understand employee perception

of ARC culture and areas of improvement for management as organisational transformation initiatives progress.

The ensuing energy crisis in the country presents a new set of challenges for the ARC. The increased pressure on financial resources exacerbates the situation. The immediate concern and area of action are avoiding the negative impact of the unavailability of electricity on some of the country's national assets in the ARC's custody. The ARC will also strengthen its business continuity plans with the elevated risk nationwide. In the medium term, investments in alternative energy sources will continue to progress, ultimately benefiting the ARC in the long term.

The most important resource for the ARC is its people. The ARC will continue advancing its Employer Value Proposition. In this pursuit, the ARC has now received the Top Employer certification for 2023. The audit for 2024 will commence shortly. This demonstrates the organisation's commitment to creating an environment where ARC staff can grow and thrive. Staff engagement is one of the important aspects of this exercise. The staff engagement section of the EVP has been rebranded to the Silalele, emphasising the intention of the initiative. This also comes with additional opportunities for staff to engage the leadership of the organisation. The CEO and executive team members will also continue with physical interactions through campus visits, which remain a priority for the CEO as part of staff engagement.

Interaction with external stakeholders is being prioritised, with several stakeholder engagement initiatives underway. This is also supported by a stakeholder engagement plan that has been reviewed and bringing in new approaches. The ARC revitalised working relationship with DALRRD through a new SLA provides a solid foundation for the ARC to play its role and contribute to the objectives of improved agricultural production to stimulate economic development and food security. Targeted provincial-level initiatives are also receiving attention, and there is an increased focus on strengthening channels of working with organised industry formations.

In 2023/24, a specific effort will need to be directed toward improved governance, building on the improvements in the current year. The effort to implement the Audit Improvement Plan is extended to identify new areas where the ARC can improve governance.

The year 2023 has been designated by the United Nations General Assembly as the International Year of Millets (IYM 2023). The Food and Agriculture Organisation (FAO) is the lead agency for celebrating the Year in collaboration with other relevant stakeholders. The ARC is gearing itself to work with stakeholders in taking this as an opportunity to raise awareness about some of its work on millets in support of #IYM2023 and supporting sustainable production of this crop type.

It will be a considerable amount of work, noting that this is a high-level summary of the planned initiatives. I look forward to the challenge of driving this organisational transformation journey that will reposition the ARC and reconnect with stakeholders. I am confident that with the ARC staff and management team, we will pull together to bring this APP to fruition. The support and guidance of the Minister and Council will continue to be the critical ingredient.



Dr. Litha Magingxa

Chief Executive Officer and President

AGRICULTURAL RESEARCH COUNCIL

OFFICIAL SIGN-OFF

It is hereby certified that this 2023/24 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; and
- 3) Accurately reflects the outputs and targets that the Agricultural Research Council will endeavour to achieve over the 2023/24 financial year.



Dr. N. Motete
EXECUTIVE:
CROP SCIENCES



Dr. A. Magadlela
EXECUTIVE:
ANIMAL
SCIENCES



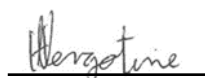
Dr. P. Chaminuka
EXECUTIVE:
IMPACT &
PARTNERSHIPS
(Acting)



Dr. H. Vergotine
EXECUTIVE: HR,
MARKETING &
LEGAL SERVICES
(Acting)



Dr. T. Sethibe
EXECUTIVE:
INFORMATION
SYSTEMS



Dr. Hilton Vergotine
GENERAL MANAGER: RISK AND PLANNING

27 February 2023

Date



Mr Abdul Carim
CHIEF FINANCIAL OFFICER

27 February 2023

Date



Dr. Litha Magingxa
CHIEF EXECUTIVE OFFICER AND PRESIDENT

27 February 2023

Date

APPROVED BY:



Ms. Joyene Isaacs
ACCOUNTING AUTHORITY
CHAIRPERSON OF COUNCIL

27 February 2023

Date

ABBREVIATIONS AND ACRONYMS

4IR	4th Industrial Revolution
AAMP	Agriculture and Agro-processing Masterplan
ACI	Agribusiness Confidence Index
AfCFTA	African Continental Free Trade Agreement
AGSA	Auditor-General of South Africa
AI	Artificial Intelligence
AP	Animal Production
APP	Annual Performance Plan
ARC	Agricultural Research Council
AU	African Union
AX	Microsoft Dynamics AX
CALS	Comprehensive Land Agrarian Strategy
CEO	Chief Executive Officer
CETC	Community Education Training Centre
COVID-19	Coronavirus disease
CSIR	Council for Scientific and Industrial Research
DALRRD	Department of Agriculture, Land Reform, and Rural Development
DBSA	Development Bank of Southern Africa
DCDT	Department of Communications and Digital Technologies
DFFE	Department of Forestry, Fisheries and Environment
DHET	Department of Higher Education and Training
DMRE	Department of Mineral, Resources, and Energy
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
EDI	Equity Diversity and Inclusivity
EIA	Environmental Impact Assessment
EM	Executive Management
EMC	Executive Management Committee

EMDEs	Emerging Markets and Developing Economies
EPV	Employee Value Proposition
ERP	Enterprise Resource Planning Solution
ESD	Enterprise Supplier Development
EU	European Union
FSR	Farming System Research
FY	Financial Year
GAP	Good Agricultural Practices
GC	Grain Crops
GDP	Gross Domestic Product
GE	Group Executive
GHG	Greenhouse Gas
GMP	Good Manufacturing Practice
GPS	Global Positioning System
GVP	Gross Value Production
ICT	Information and Communication Technology
IDC	Industrial Development Corporation
IGC	International Grains Council
INF-NVB	Deciduous Fruit, Vines, and Wine
INTERGIS	Integrated Registration and Genetic Information System
IPCC	Intergovernmental Panel on Climate Change
ISC	International Science Council
KPI	Key Performance Indicator
KyD	Kaonafatso ya Dikgomo
M&E	Monitoring and Evaluation
MODIS	Moderate Resolution Imaging Spectroradiometer
MTEF	Medium-Term Expenditure Framework
MTSF	Medium-Term Strategic Framework
NDP	National Development Plan
NRE	Natural Resources and Engineering (Soil, Climate and Water & Agricultural Engineering)
NRF	National Research Foundation
OBP	Onderstepoort Biological Products
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
PSET	Post-School Education and Training
PwD(s)	People with Disability(ies)
RIS	Research and Innovation Systems
R&D	Research and Development
RPO	Red Meat Producers Organisation
RQO	Resource Quality Objectives
RVF	Rift Valley Fever
SAAGA	South African Avocado Growers Association
SADC	Southern African Development Community
SAGAP	South African Good Agricultural Practices
SAPPA	South African Pecan Nut Producers Association
SAWS	South African Weather Service
SCM	Supply Chain Management
SDG	Sustainable Development Goal
SET	Sector Education Training
SETA	Sector Education and Training Authority
SG	Small Grains
SM	Senior Manager
SMART	Specific, Measurable, Achievable, Realistic and Time-bound
SMME	Small, Medium, and Micro Enterprise
SOC	State-Owned Company
SOPs	Standard Operating Procedures
SPI	Standardised Precipitation Index
S&T	Subsistence and Travel
SWOT	Strengths, Weaknesses, Opportunities, Threats
TSC	Tropical and Subtropical Crops
TVET	Technical and Vocational Education and Training

VCI	Vegetation Condition Index
VIMP	Vegetables, Industrial and Medicinal Plants (former Vegetable and Ornamental Plant Institute and Industrial Crops)
VOCs	Variants of Concern
WCT	Winter Cereal Trust
WINETECH	Wine Industry Network for Expertise and Technology
WRC	Water Research Commission

TABLE OF CONTENT

EXECUTIVE AUTHORITY STATEMENT.....	1
ACCOUNTING AUTHORITY STATEMENT.....	2
CHIEF EXECUTIVE OFFICER AND PRESIDENT STATEMENT	6
ABBREVIATIONS AND ACRONYMS	10
PART A: OUR MANDATE.....	16
1. <i>UPDATES TO RELEVANT LEGISLATIVE AND POLICY MANDATES.....</i>	<i>19</i>
1.1. Updated Legislative Mandates	19
1.2. Updated Policy Mandates.....	19
2. <i>UPDATES TO INSTITUTIONAL POLICIES AND STRATEGIES</i>	<i>19</i>
3. <i>UPDATES TO RELEVANT COURT RULINGS.....</i>	<i>20</i>
PART B: OUR STRATEGIC FOCUS	21
4. <i>SITUATIONAL ANALYSIS.....</i>	<i>21</i>
4.1. External Environment Analysis	21
4.2. Internal Environment Analysis	43
4.3. Summary of Critical Issues informing the 2023/24 Annual Performance Plan.....	50
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
5.2. ARC Outcome 2: Sustainable Ecosystems and Natural Resources.....	58
5.3. ARC Outcome 3: Improved Nutritional Value, Quality and Safety of Agricultural Products	63
5.4. ARC Outcome 4: A Skilled and Capable Agriculture Sector	68
5.5. ARC Outcome 5: Enhanced Resilience of Agriculture.....	76
5.6. ARC Outcome 6: A High-Performing and Sustainable Organisation	82
6. <i>THE ARC FINANCIAL PLAN AND ANNUAL BUDGET FOR 2023/24 AND THE MTEF.....</i>	<i>91</i>
6.1. Projected Revenue for 2023/24 MTEF PERIOD	92
6.2. Projected Expenditure for 2023/24 MTEF PERIOD	94
6.3. CONSOLIDATED RESOURCES ALLOCATION.....	96
6.4. CONSOLIDATED FINANCIAL STATEMENTS OVERVIEW	97
7. <i>MATERIALITY FRAMEWORK</i>	<i>100</i>
8. <i>UPDATED KEY RISKS.....</i>	<i>103</i>
9. <i>PUBLIC ENTITIES.....</i>	<i>105</i>

10. INFRASTRUCTURE PROJECTS.....	105
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	140
ANNEXURE E:BOARD AND SUB-COMMITTEE CHARTERS.....	143
ANNEXURE F:SWOT, PESTEL and STAKEHOLDER ANALYSIS	144

■

PART A: OUR MANDATE

To deliver on the priorities of the current government and informed by instructing legislations and policies, the ARC has described its role through the 2020-2025 Strategic Plan as follows:

To conduct agricultural research, development, drive technology development, and dissemination to:

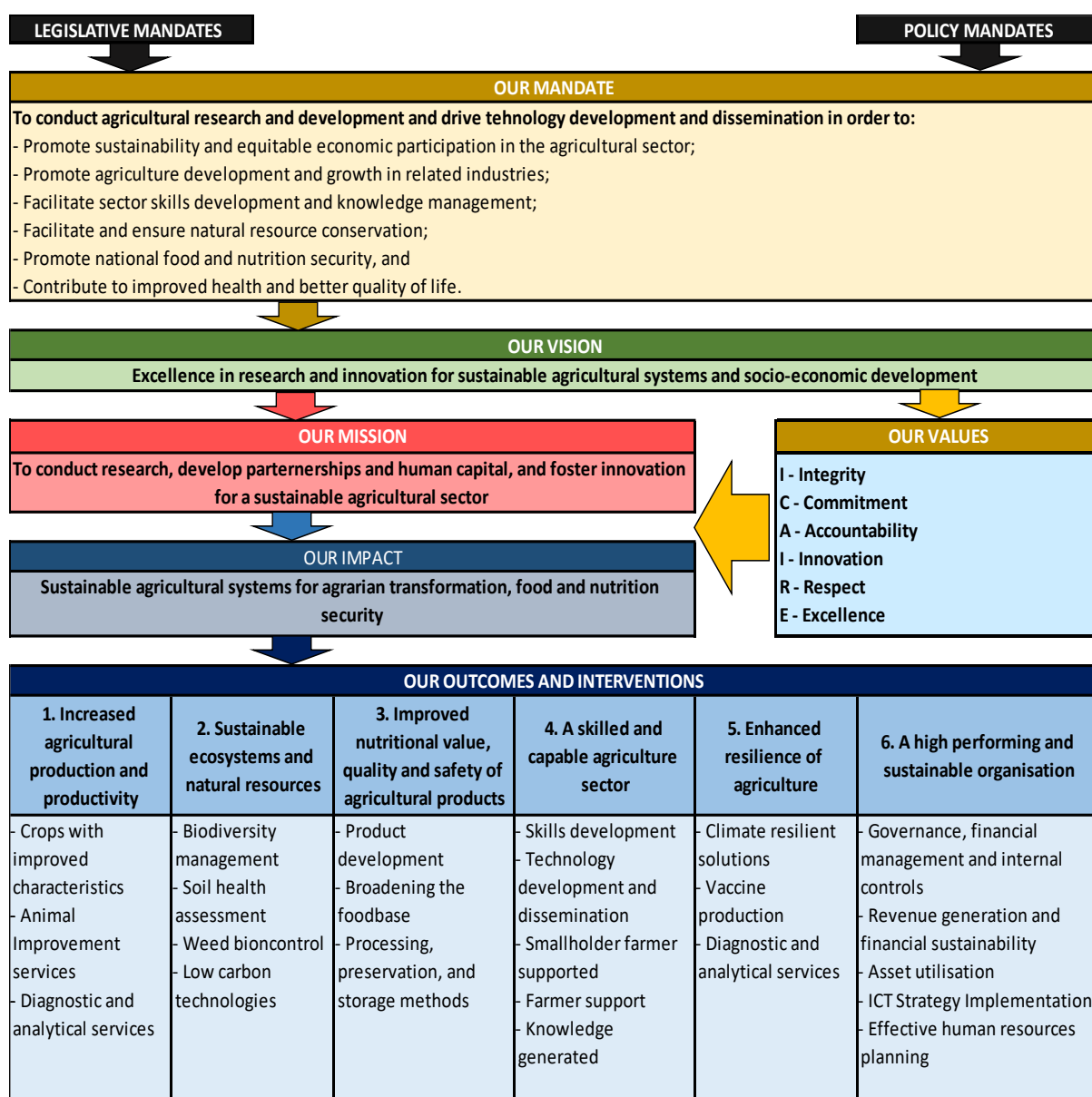
- promote sustainability and equitable economic participation in the agricultural sector;
- promote agriculture development and growth in related industries;
- facilitate sector skills development and knowledge management;
- facilitate and ensure natural resource conservation;
- promote national food 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 transparent, honest, truthful, consistent, and ethical 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 yearly performance plans for the period of the Strategic Plan.

The 2023/24 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

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/when necessary.

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/when 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
Agriculture and Agro Processing Master Plan (AAMP)	Coordinated Master Plan with focussed actions for the Agricultural sector.

2. UPDATES TO INSTITUTIONAL POLICIES AND STRATEGIES

The table below provides updates to the institutional policies and strategies made during the 2022/23 FY that will apply to the 2023/24 Annual Performance Plan.

UPDATED /NEW INSTITUTIONAL POLICIES AND STRATEGIES	IMPLICATION
Marketing and Communication Strategy	Incorporates a thought leadership approach to maintain the ARC positioning while attracting new and emerging stakeholder bases for growth underpinned by sustainability.
Commercialisation Strategy	Commercialisation of ARC R&D outputs that would cater to the ARC long-term research pipeline and aggressively exploit our non-R&D (property, laboratory services, and products) opportunities.
Employee Value Proposition	An employee-centered approach that aligns existing integrated staff planning strategies to act as a key driver of talent attraction, engagement, and retention.
Corporate Security Policy	Laying down a set of security rules by which all employees, visitors, and service providers must abide
Fleet Management Policy	Manage the use of vehicles and provide controls to mitigate associated risks while also promoting responsible vehicle use while ensuring effective management of vehicles for ARC purposes
Property Management Strategy	Implementing an assets management system to control and manage ARC assets effectively and efficiently.
Records Management Policy	Assist the ARC in the creation, management, storage, safeguarding, retention, and disposal of records in accordance with the National Archives and Records Service of South Africa Act.
Implementation Plan: Institutional Review Recommendations	Formal and structured approach that would ensure the implementation of the Institutional Review Recommendations over the 2021/2022 period.

3. UPDATES TO RELEVANT COURT RULINGS

No court judgments or rulings have a material and/or direct bearing on the mandate and/or core operations of the Agricultural Research Council.

PART B: OUR STRATEGIC FOCUS

4. SITUATIONAL ANALYSIS

The Agricultural Research Council executes its mandate and seeks to achieve its vision and mission in a complex environment impacted by global, national, and provincial events, directly affecting the pursuit of its desired impact and delivering on its mandate. The section below highlights the various external and internal factors that could affect the ARC's ability to fulfill its mandate.

4.1. EXTERNAL ENVIRONMENT ANALYSIS

GLOBAL ECONOMIC OUTLOOK

In 2022, the global economy continued to experience the effects of more than two years of the COVID-19 pandemic. Added to that was a significant negative shock of the Russia-Ukraine war, which led to deep regional slowdowns and substantial negative global spillovers, contributing to the downgrading of growth in Emerging Markets and Developing Economies (EMDEs) in 2022. The global GDP stagnated more than expected in 2022, and output declined in the G20 economies.⁴ Global growth was forecast to decrease from 6.0% in 2021 to 3.2% in 2022. This slowdown in growth was caused by the US GDP contracting significantly in the first half of 2022, the euro area contracting in the second half of 2022, the extended COVID-19 outbreaks and lockdowns in China, and the escalating crisis in the property market.⁵

For 2023, global growth is projected to slow even further than 2022, to 2.7%, with global GDP anticipated to be at least USD2.8 trillion lower in 2023.⁶ This again reflected significant slowdowns for the largest economies, the significant disruption of activities and trade due to the invasion of Russia of Ukraine, withdrawn policy support, and fading pent-up demand amidst high inflation. With predictions of more pandemics on the way, the aim is not to end them but to learn how to manage them better in terms of response time about relevant actions, financial controls, and education.

Additionally, inflation rose to historic levels, prompting an immediate tightening of monetary policy and a squeeze on household budgets. The first half of 2022 saw the highest inflation levels in many economies since the 1980s. The increase in inflation has expanded across many economies, suggesting the impact of cost pressures from disrupted supply chains, and has been partially attributed to increased food and energy prices.⁷ The combination of sluggish growth and high inflation has increased the risk of stagflation⁸. However, global inflation is forecast to decline slightly from 8.8% in 2022 to 6.5% in 2023 and 4.1% in 2024.

⁴ <https://www.oecd.org/economic-outlook/september-2022/>

⁵ <https://www.imf.org/en/Publications/WEO/Issues/2022/10/11/world-economic-outlook-october-2022>

⁶ <https://www.oecd.org/economic-outlook/september-2022/>

⁷ <https://www.imf.org/en/Blogs/Articles/2022/07/26/blog-weo-update-july-2022>

⁸ <https://www.worldbank.org/en/publication/global-economic-prospects>

EMERGING MACRO-ECONOMIC FACTORS AND TRENDS

Several factors affected the global macro economy in 2022 and will continue to do so into 2023. These include the lingering effects of COVID-19, the ongoing war between Russia and Ukraine, widespread inflation, high unemployment, and reduced energy supplies. There has been a general boost in economic activities as COVID-19 infections dropped worldwide. However, global growth continued to slow down in 2022 and is expected to slow down further into 2023.

Another contributing factor to the slowing global economic growth has been tightening monetary policy to curb higher-than-expected inflation. "Tight labour market conditions with unemployment rates close to 20-year lows in many countries are boosting wages and helping to improve purchasing power and growth, thereby also contributing to increased inflation in many countries".⁹ Structural reforms will also be necessary to support the fight against inflation.

Russia's reduction in energy supplies is another important factor affecting the global economic outlook. Energy shortages could increase global energy prices without sufficient energy supply diversification and demand reductions. This may require rationing of energy use. Multilateral cooperation will be necessary to fast-track the green energy transition and prevent fragmentation.¹⁰ These factors continue to play an essential role in the global economy and will continue to affect the global economy in the short to medium term.

SOUTH AFRICAN ECONOMIC OUTLOOK AND EMERGING TRENDS

The South African economy continues to recover from the effects of the COVID-19 pandemic, although more slowly than expected.¹¹ The COVID-19 pandemic weakened an already fragile economy, with the country underperforming in the past decade. After two consecutive quarters of positive growth, the South African economy's real GDP decreased by 0.7% in the second quarter of 2022¹². This resulted from the floods in KwaZulu-Natal that hit the manufacturing industry hardest. In contrast, the prolonged load shedding in the electricity, gas, and water supply industries hampered economic activities due to a lack of generation capacity. There was, however, slight positive growth in the South African economy in the third quarter of 2022, with the economy marginally escaping negative growth in the quarter¹³. This was mainly due to positive performance in the mining and manufacturing sectors.

In the agriculture, forestry, and fisheries sectors, activities were lower by 7.7%, caused by a decrease in the production of animal products. This was because of the spread of the foot-and-mouth disease due to the lack of a vaccine and electricity outages. Net trade also contributed negatively as exports rose much less than imports¹⁴.

For 2023, National Treasury forecasts a decline in economic growth from 2.1% in 2022 to 1.6 percent in 2023 and a slight increase to 1.7% in 2024¹⁵. Existing structural constraints such as high unemployment and labour market rigidities contribute to the relatively lower expected economic growth.

⁹ <https://www.imf.org/en/Publications/WEO>

¹⁰ <https://www.imf.org/en/Publications/WEO>

¹¹ <https://www.worldbank.org/en/country/southafrica/overview>

¹² <https://www.statssa.gov.za/?p=15728>

¹³ <https://www.moneyweb.co.za/news/economy/citibank-cautiously-optimistic-about-sas-2023-economic-outlook/>

¹⁴ <https://tradingeconomics.com/south-africa/gdp-growth>

¹⁵ <https://www.treasury.gov.za/documents/national%20budget/2022/review/Chapter%202.pdf>

On the other hand, food inflation is forecast to decrease from 5.1% in 2022 to 4.4% in 2023 and increase slightly to 4.5% in 2024¹⁶. The risks to the South African growth outlook include supply constraints linked to raw material shortages, disruptions in global supply chains, and elevated production costs. In addition, prolonged interruptions in electricity supply continue to be a severe hindrance to domestic growth.

GLOBAL OUTLOOK FOR AGRICULTURE

Over the next decade, the global agri-food industry will face significant challenges, including the climate crisis's effects and the lingering economic repercussions of supply shocks related to the Ukraine conflict that impact oil, natural gas, and food prices. Given that the war is anticipated to continue through at least 2023, there will likely be severe disruption of commodity supply chains and a potential rise in the prices of agricultural and energy commodities, rekindling pressures for global inflation. Again, a drop in global food production and food supply from major exporting nations, such as Russia and Ukraine, could result in lower food availability leading to an estimated 19 million more people experiencing chronic undernourishment.¹⁷ This is happening amid an expected increase in global food consumption of 1.4% each year, mainly driven by population growth, with the bulk of the additional demand for food originating in low- and middle-income countries, which are, however, expected to play a significant role in feeding this demand growth given their livestock production's rapid expansion and intensification.¹⁸

The outlook emphasises how agriculture significantly contributes to climate change. Livestock is expected to be responsible for 90% of the predicted 6% rise in direct greenhouse gas (GHG) emissions from agriculture over the next ten years. To meet the Zero Hunger Sustainable Development Goal (SDG) target while keeping agricultural emissions on track to reach the Paris Agreement targets, agricultural productivity is projected to increase by 28% over the next 10 years, more than triple the increase in the last decade.¹⁹ The increase in global productivity is expected to be driven by a 24% increase in crop productivity and 31% in animal productivity.

SOUTH AFRICAN AGRICULTURAL OUTLOOK

According to BFAP (2022),²⁰ South Africa's seasonally adjusted GDP increased by 1.6% in the Q3 of 2022, with agriculture being one of the main drivers of its growth, along with banking, transportation, manufacturing, and mining. Seasonally adjusted, the agriculture industry expanded by 19.2% between the Q2 and Q3 of 2022. However, the sector exhibits a rise of 22.3% compared to the third quarter of 2021. Accordingly, the disaggregated Gross Value of Production (GVP) per industry compiled by the

¹⁶ <https://www.treasury.gov.za/documents/national%20budget/2022/review/Chapter%202.pdf>

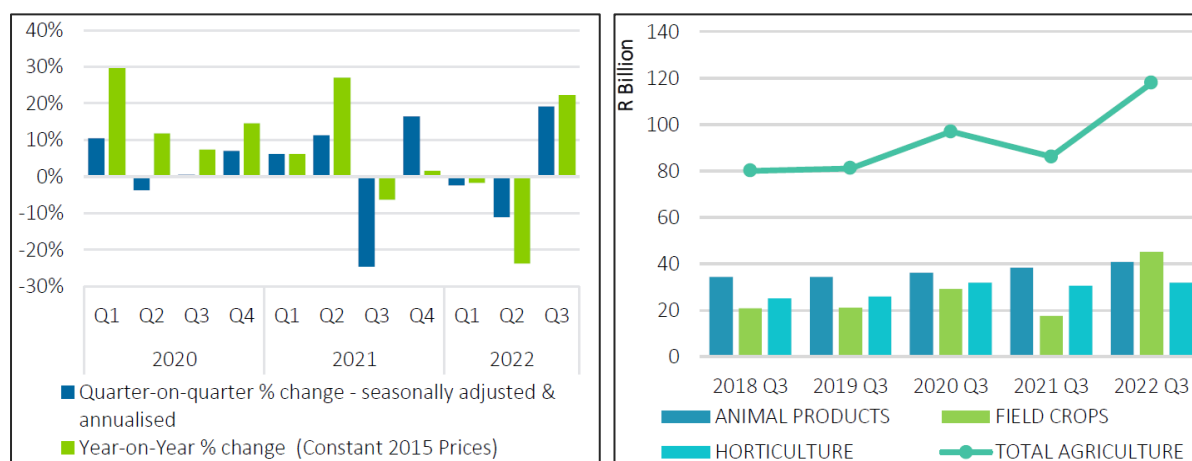
¹⁷ OECD/FAO (2022). OECD-FAO Agricultural Outlook 2022–2031, OECD/FAO 2022. <https://www.oecd-ilibrary.org/docserver/f1b0b29c-en.pdf?expires=1670834831&id=id&accname=guest&checksum=89BE282F557326373EB7B3B0595BA329>

¹⁸ OECD/FAO (2022). OECD-FAO Agricultural Outlook 2022–2031, OECD/FAO 2022. <https://www.oecd-ilibrary.org/docserver/f1b0b29c-en.pdf?expires=1670834831&id=id&accname=guest&checksum=89BE282F557326373EB7B3B0595BA329>

¹⁹ OECD/FAO (2022). OECD-FAO Agricultural Outlook 2022–2031, OECD/FAO 2022. <https://www.oecd-ilibrary.org/docserver/f1b0b29c-en.pdf?expires=1670834831&id=id&accname=guest&checksum=89BE282F557326373EB7B3B0595BA329>

²⁰ BFAP, 2022. Perspectives on Agriculture's Performance in Q3 of 2022 <https://www.bfap.co.za/wp-content/uploads/2022/12/GDPBrief2022Q3.pdf>

DALRRD highlights the field crops, animal and livestock sub-sectors as the main drivers leading to the performance of the agricultural sector in the Q3 of 2022.



Change in real agricultural GDP (a) and GVP per quarter (b) Source: 21

The main driver was the field crop sub-sector, with a more than double GVP in the Q3 of 2022 compared to Q3 of 2021, mainly owing to high grains and oilseed prices brought on by global forces.²² Also linked to this growth is a favourable and robust summer crop harvest in the 2021/22 season that has seen more than double deliveries of white and yellow maize and soybean in Q3 of 2022, while sunflower witnessed a 66% output increase. However, Q3 performance was also supported by delays in the maize harvest, representing some correction from the Q2 decline. Although 5% smaller than the bumper harvest of 2021, the total maize crop of 15.3 million tonnes was still well above average. On the other hand, wheat had a 5% gain, which was more due to high wheat prices than it was to output.

The animal sub-sector was the second placed, contributing 7% year-on-year, driven mainly by the cattle and poultry industries that have witnessed a 65% growth owing to the high beef and poultry prices that rose by 16% and 18% in Q3 of 2022 compared to 2021, respectively. The other contribution was realised from the pork and sheep industries, which gained 5% in Q3 of 2022 and was also supported by high prices that grew with a 7% increase y-o-y. Overall, the persistent high feed prices continue to strain the producer margins and are likely to threaten the performance of the livestock sub-sector.

The horticulture sub-sector was the third-placed contributor, posting a 5% growth in GVP in the Q3 of 2022 owing to favourable export volumes due to good yields, especially in the citrus industry, which rose by 4%. This is despite lower per unit returns at farm level attributed to several factors that include lacklustre markets, with consumer spending under pressure, together with increases in downstream costs in the value chain, which are impacting negatively on producers, who are already squeezed by substantial input cost increases on farm level, coupled with continuously increasing freight rates.²³

The agricultural sector has also been characterised by the deterioration in the Agbiz/IDC Agribusiness Confidence Index (ACI) in Q3 of 2022, owing mainly to the spike in fuel prices, rampant food inflation, and the weakening of the rand against the US dollar.²⁴ The sector is, however, expected to return to a

²¹ (a) - Stats SA, 2022 and (b) DALRRD, 2022 in BFAP, 2022. Perspectives on Agriculture's Performance in Q3 of 2022 <https://www.bfap.co.za/wp-content/uploads/2022/12/GDPBrief2022Q3.pdf>

²² BFAP, 2022. Perspectives on Agriculture's Performance in Q3 of 2022 <https://www.bfap.co.za/wp-content/uploads/2022/12/GDPBrief2022Q3.pdf>

²³ BFAP, 2022. Perspectives on Agriculture's Performance in Q3 of 2022 <https://www.bfap.co.za/wp-content/uploads/2022/12/GDPBrief2022Q3.pdf>

²⁴ Farmer's weekly. 2022. 'Agri sector outlook cautiously optimistic, despite challenges'.

positive growth path in the 2022/23 season amid a myriad of challenges. For example, the sector continues to be at risk because of higher input costs, persistent animal health concerns regarding foot-and-mouth disease outbreaks, rising interest rates, and intensified due to geo-political risks that continue to disrupt supply chains. Also, the trade and logistics disruptions due to the continued Russia-Ukraine war affecting export volumes are expected to have negative implications for the 2022/23 agricultural season.

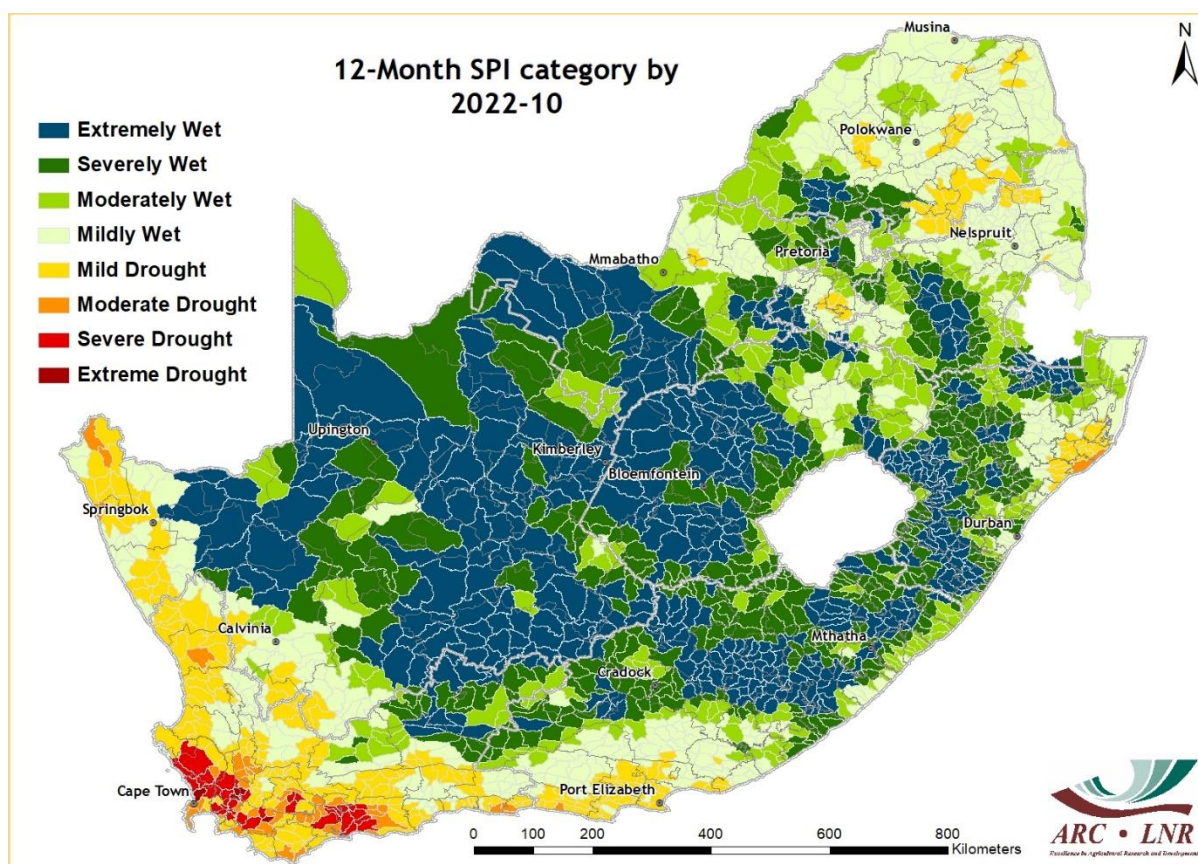
The pivotal role of agricultural Research & Development (R&D) has to be strongly emphasised. There is a need to increase agricultural investment and innovation and to facilitate the transfer of knowledge, technology, and skills toward putting the agricultural sector on the essential trajectory for sustainable productivity growth and the transition to sustainable food systems. Further, there is a need for comprehensive action to ensure that the agricultural sector effectively contributes to global GHG emission reductions through the widespread adoption of climate-smart production processes and technologies, particularly in the livestock sector. The ARC should continue pushing back the frontiers of science:

- Increasing efficiency and cost-reduction;
- Finding additional/alternative sources of funding through mutually beneficial collaborations, partnerships, and clients; and
- Leveraging emerging research innovations due to the global shocks towards agricultural sector resilience.

CURRENT AND FUTURE CLIMATE CONDITIONS WITH IMPLICATIONS ON AGRICULTURAL PRODUCTION

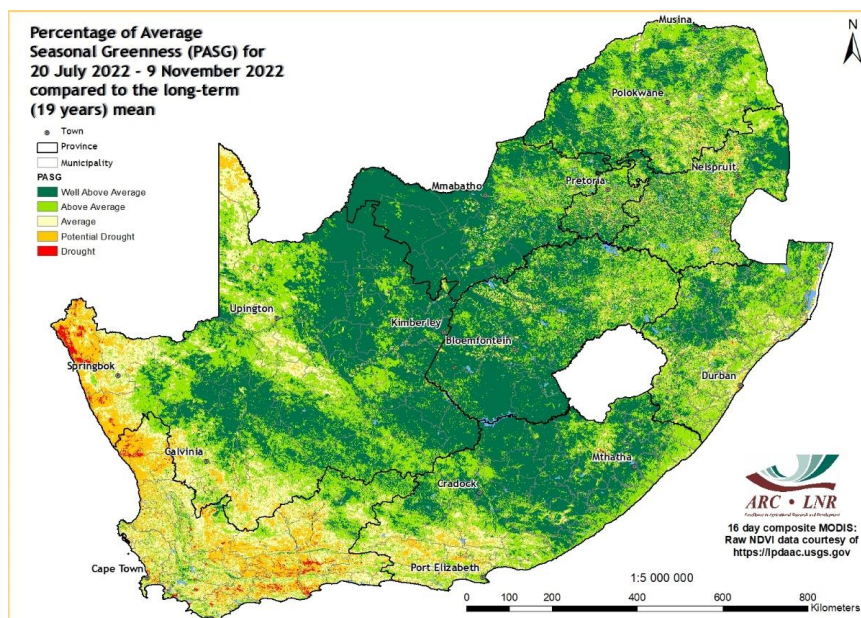
Above-normal rainfall occurred over the summer rainfall region since mid-October 2022, similar to the previous summer (2021/22), which was characterised by above-normal rainfall over large parts of the country. The above-normal rainfall over the central to eastern interior is reflected by the Standardised Precipitation Index (SPI) map below for the 12-month period from November 2021 to October 2022, based on data from the ARC and South African Weather Service (SAWS) weather station networks. Above-normal rainfall continued through November into early December, and the outlook for the remainder of the summer remains favourable for rainfall, given the current La Niña in progress.

<https://www.farmersweekly.co.za/agri-news/south-africa/agri-sector-outlook-cautiously-optimistic-despite-challenges/>



Standardised Precipitation Index (SPI) for the 12-month period up to October 2022.

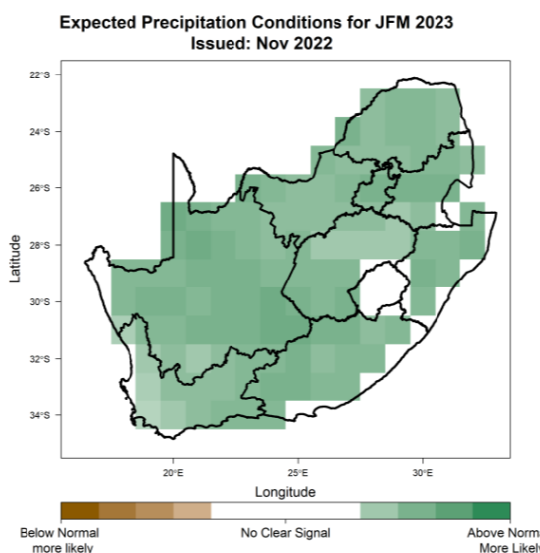
The winter rainfall region experienced mostly below-normal rainfall during the 2022 winter, negatively impacting crop production and vegetation activity in general. Drought conditions or borderline drought conditions are present over the winter rainfall region, also stretching eastwards along the Garden Route into the southern parts of the Eastern Cape. However, the negative impact on winter wheat production in the winter rainfall region was largely offset by favourable conditions and above-normal production of wheat over the interior. The winter rainfall region has remained largely drier than normal during the last 12 months, and the related stress in the vegetation activity is clearly visible in the latest Percentage of Average Seasonal Greenness (PASG) map for July to November 2022 below, produced from the MODIS (Moderate Resolution Imaging Spectroradiometer) data archive.



Percentage of Average Seasonal Greenness for July to November 2022, showing areas with above-average (below-average) vegetation activity in green (brown).

In other regions, vegetation activity reflects a very favourable situation, reminiscent of the favourable grazing conditions and the near-record maize and soybean production during the 2021/22 summer.

The figure below shows the latest seasonal rainfall forecast issued by the South African Weather Service²⁵ in November 2022 for the rest of the 2022/23 summer (January, February and March 2023). The forecast is consistent with seasonal forecasts issued by other international organisations.

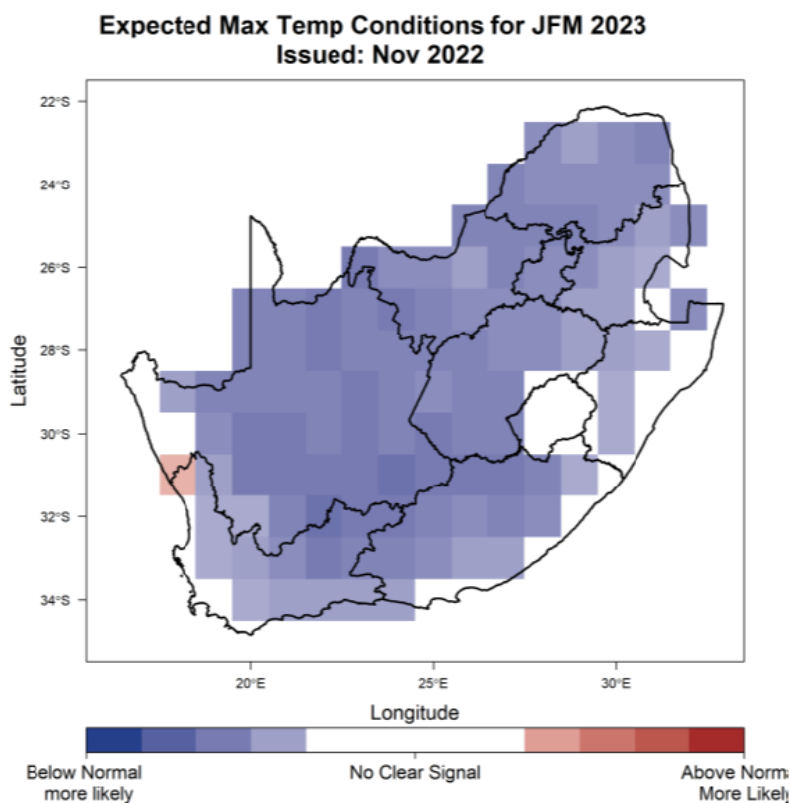


January-February-March (JFM) 2023 seasonal precipitation prediction by SAWS. The map indicates the highest probability from three probabilistic categories, namely above normal, near normal, and below normal.

As during the 2021/22 summer, seasonal forecasts still indicate relatively wet conditions during the current summer. Coupled with above-normal rainfall, the country is expected to be relatively cool. If the above-normal rainfall continues, maximum temperatures will be near to below normal over large parts. The current seasonal temperature outlook for January to March 2023 (below) indicates an expectation

²⁵ Available: <https://www.weathersa.co.za/>

of below-normal temperatures over the country. The near- to below-normal maximum temperatures expected is indicative of somewhat greater cloud cover, usually associated with wetter conditions.

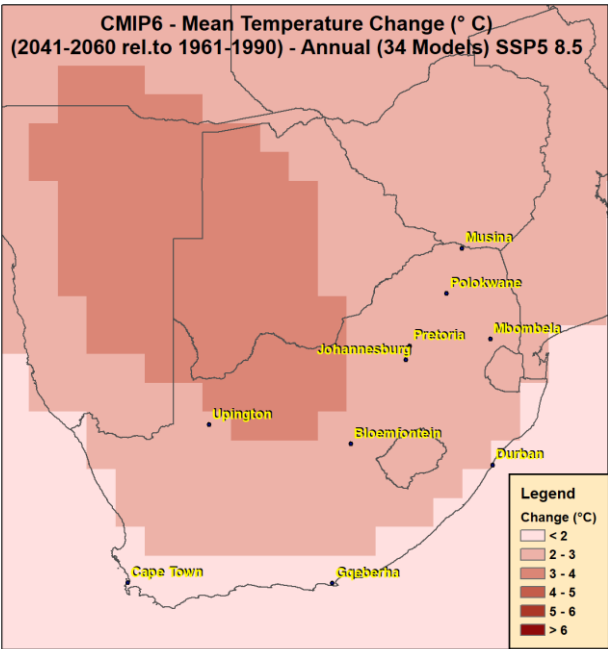


January-February-March (JFM) seasonal maximum temperature prediction by SAWS. The map indicates the highest probability from three probabilistic categories, namely above normal, near normal and below normal.

Normal to below-normal maximum temperatures during mid-to late summer support 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 in late summer can hamper production, but this is usually a more significant problem if the crops are planted late. Extended cloudy spells can result in a deficiency in heat units, but it remains to be seen whether January and February will indeed be characterised by prolonged overcast conditions. With the wet conditions since mid-October, the extensive cloud cover has already resulted in a deficiency in heat units for the November to early December period.

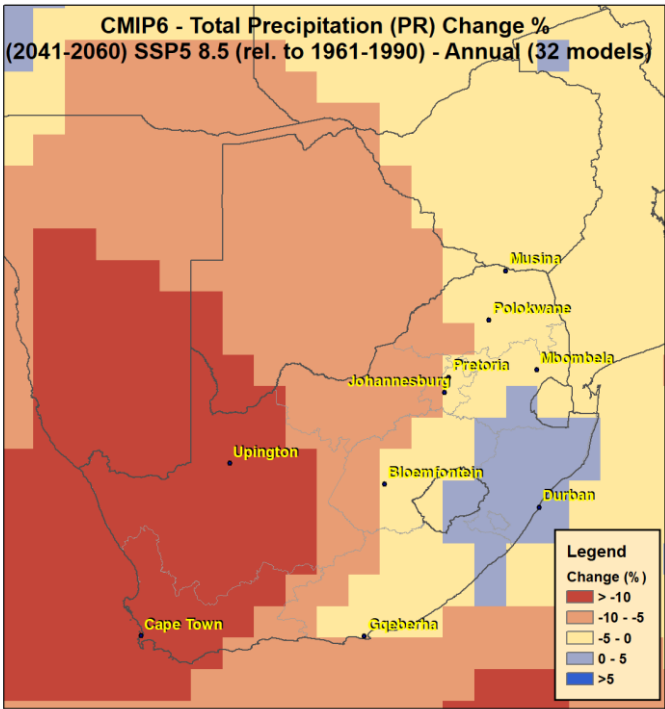
Because summers tend to be cooler and wetter when La Niña conditions are present, there is also an elevated risk for fungal pathogens in summer crops. Moreover, widespread rainfall events may sometimes lead to flooding, as was experienced over large parts of the country during the 2020/21 and 2021/22 summers. Moreover, dam levels are relatively high following two consecutive wet summers, increasing the risk of flooding should widespread heavy rainfall events occur during the 2022/23 summer.

Looking further ahead, the latest International Panel on Climate Change (IPCC) Assessment Report (AR6) has recently been released. Regarding the outlook for South Africa, expected trends through the 21st century remain similar to those associated with the previous assessment report (AR5). Features captured in the report, particularly for SA, include a warming trend through the 21st century, exacerbated by higher atmospheric carbon dioxide concentrations, and focussing the largest increases over the central to north-western parts of the interior (see figure on next page).



Projected mid-century mean temperature change relative to the 1961-1990 mean under a low-mitigation scenario. Original data obtained from the IPCC Working Group I (WGI): Sixth Assessment Report - Interactive Atlas.

With regard to rainfall, the western parts of the country are expected to become drier while the signal for the eastern parts of the country is uncertain (see figure below). There is also a robust signal for drier conditions over the winter rainfall region, associated with a southward displacement of frontal systems in a warmer climate.



Projected mid-century mean annual rainfall change (%) relative to the 1961-1990 mean under a low-mitigation scenario. Original data obtained from the IPCC Working Group I (WGI): Sixth Assessment Report - Interactive Atlas.

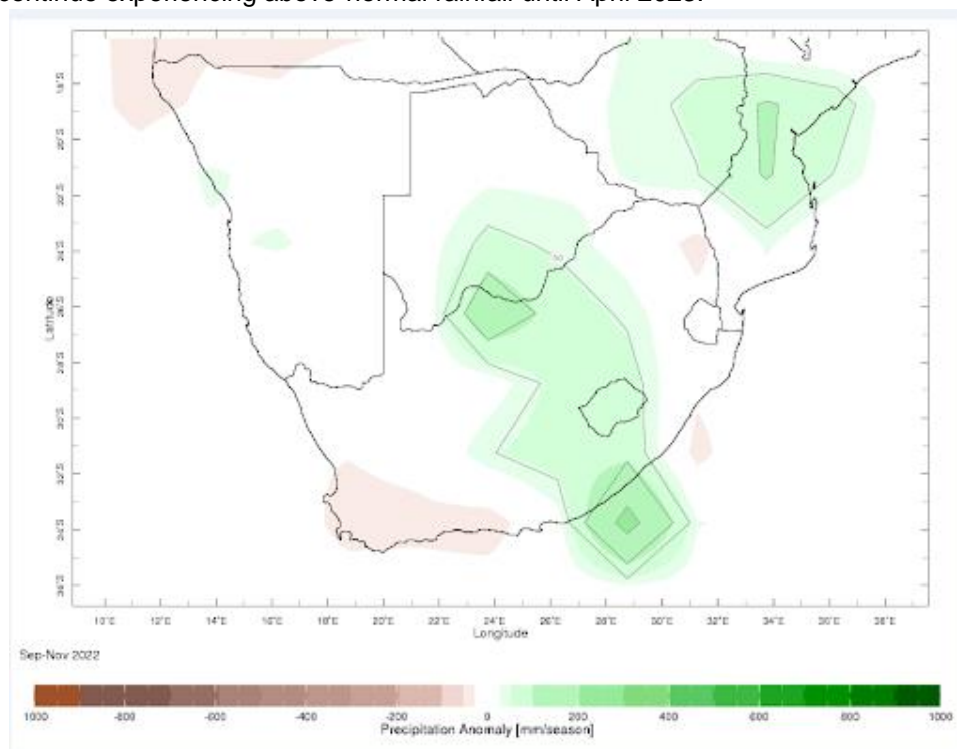
Over and above the projected change in mean annual rainfall, there are also indications that the length of the dry season over the summer rainfall region may extend as the result of a later advent of the summer rainy season on average.

The projected changes in temperature and rainfall will have implications for both dryland and irrigated cultivation as well as livestock production. The findings with regard to these will remain similar to those found in studies based on the IPCC AR5 model results and are related to higher temperatures causing marginal areas (the warmer, drier parts) to become unsuitable for crops that are currently produced in those areas, whilst such crops may be produced in areas that are currently less suited because the temperatures are too low. Over the winter rainfall region, irrigation water and rainfall for dryland production of grains may become scarce as the region is expected to become more arid.

The article below was written by ARC researchers for the Mail and Guardian (14 December 2022):

Are we in a particularly bad rainy season?²⁶

It is not easy to say whether we are having a good or bad rainy season. Compared to previous years, the current rainy season has been characterised by above-normal rainfall totals over some areas (as per the figure below), and according to forecasts from the South African Weather Service, we will probably continue experiencing above-normal rainfall until April 2023.



This can be viewed as a good rainy season for crop and livestock production and for our water resources. But if we think about the distribution of rainfall and the fact that flooding events are happening (in Gauteng many areas have and are experiencing flooding), then perhaps we could view the rainy season as a bad one. So really the answer here depends on one's perspective, and it is therefore best to consider both aspects.

Is the climate crisis changing our weather patterns?

Over Southern Africa, there are certainly detectable changes in our weather patterns. However, it can be difficult to say with certainty whether these are because of human-induced climate changes. The Sixth IPCC [Intergovernmental Panel on Climate Change] Assessment report has shown that there is high confidence that temperature changes since the 1950s can be attributed to human-induced climate change. Conversely, the report shows that there is little confidence that human activities have contributed to rainfall changes experienced over Southern Africa since the 1950s.

Despite this, over recent decades scientists have reported changes in both rainfall and temperatures and characteristics thereof. Regarding temperatures, Southern Africa is characterised by increasing trends, with central regions experiencing the largest warming trends, while coastal regions have experienced warming to a smaller degree. Among the temperature trends reported, the most notable are those for heat extremes.

²⁶ Article available: <https://mg.co.za/environment/2022-12-14-whats-behind-the-wet-weather-in-gauteng/>

Recent research has shown that most regions of Southern Africa are characterised by trends of increasing frequency and magnitude of heat extremes. Rainfall trends are more difficult to detect and are associated with much more uncertainty because rainfall can vary substantially from one year to the next, making it harder to statistically detect a trend.

Since roughly the 1950s, many regions of Southern Africa have experienced declining annual rainfall totals. Although it is valuable to consider changes in annual rainfall totals, it is more relevant to consider how the distribution of rainfall events has changed and how rainfall during the wet season has changed. If we consider those regions predominantly experiencing summer rainfall (all of Southern Africa, excluding the western coast and south-western Cape as well as the southern coast) during the October-March/April months, then it would be important to highlight that most regions have experienced declining trends.

Despite this, many regions are characterised by increasing trends in the frequency and magnitude of individual rainfall events. But there are also increased frequency and intensity of dry spells (consecutive dry days) happening between rainfall events.

What is a La Niña event, how long does it last and what are its effects on rainfall over Southern Africa?

A La Niña event, or more specifically phase, represents one of the phases of the El Niño Southern Oscillation (ENSO). ENSO is a natural cycle occurring in the tropical Pacific Ocean temperatures, winds and clouds. This cycle naturally swings between three phases: El Niño, Neutral and the current phase we're experiencing being La Niña. A single phase typically lasts for about a year, but this can extend up to 3 years, as we are seeing with the current La Niña phase.

We are currently in an unusual three-year spell. This happened during 1973-1976 as well as 1998-2001, when La Niña extended to a similar length as the current one.

During Neutral phases, representing "normal" conditions, the naturally occurring tropical trade winds blow from east to west as is typical, and they pile up warm water over the Indonesian island chain region (the western Pacific Ocean), leaving cooler water to pile up off the coast of South America (the eastern Pacific Ocean). This naturally causes air to rise over the warmer water region and sink over the cooler water region creating a large horizontal circulation cell known as the Walker Circulation.

The La Niña phase is similar to the Neutral phase except the trade winds blow harder and the warm and cool water contrast is larger, making the Walker Circulation even stronger. The El Niño phase can be viewed as the opposite of the Neutral and La Niña phases. The east-to-west flowing trade winds either blow much slower or even in a different direction causing the warm and cool water pile ups to switch. Each of these phases globally influences weather and climate, but their influence differs across regions. The La Niña phase promotes wetter weather over Southern Africa, but over Southern USA it can promote drier conditions.

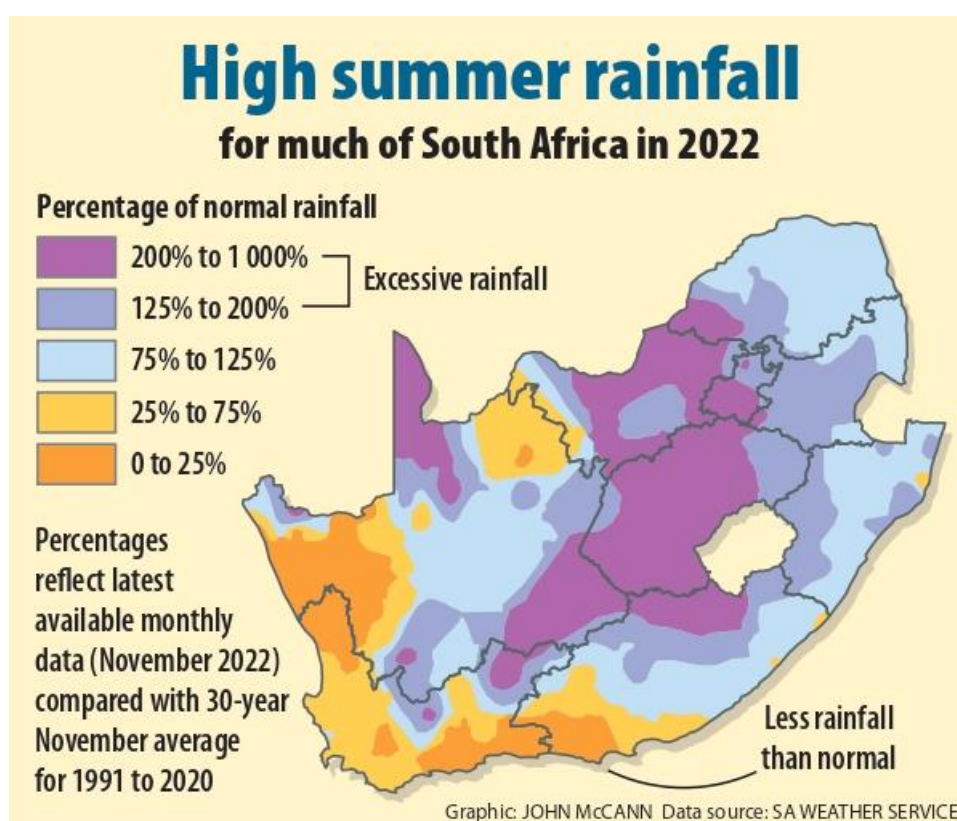
It is important that we understand ENSO but the effects on Southern African climate and weather are perhaps most important to understand. Moisture for our summer rainfall frequently comes from the southwest Indian Ocean from the generally east to west flowing winds transporting moisture inland over southern Africa. These winds are generally strong during a La Niña phase, which is a major reason why we often experience wetter than normal conditions during the summer wet season.

Because of the switch in winds during El Niño, we have less moisture flowing inland and often experience drier conditions as a result. It is important to emphasise "often" because these typical conditions do not always happen during El Niño and La Niña phases.

Specifically considering the La Niña effects over Southern Africa, these are typically wetter and cooler than normal (about a 30-year average) conditions during all of the extended summer months of October to March/April, but its strongest effect on rainfall is generally during the mid-summer months of November to February. Above normal rainfall can sound like a good thing, but this can also cause flooding if perhaps rainfall is concentrated over fewer, larger events, and therefore for extreme or intense.

Research has highlighted that flooding is often more frequent during the La Niña phase summers. This can, for example, be damaging to infrastructure. It can even be damaging to lives as seen by the recent lives lost with the flooding in Johannesburg. Also concerning is that such heavier rainfall events can influence optimal planting time and cause damage to crops, ultimately influencing food security. Many other negative effects can arise, such as water-borne diseases during flooding episodes.

There is a shift to more La Niña conditions and this may be linked to human-induced warming.



When will El Niño come and will there be a drought?

At present, there is limited certainty on when the next El Niño phase will occur. Several climate services track the status of the ENSO and also provide forecasts on its status. Currently, the forecasts suggest that the ongoing La Niña is expected to persist until early 2023. From February to April 2023, there is a reported 71% chance of ENSO-neutral conditions, meaning that it is likely the current La Niña will break.

Typically, ENSO-neutral conditions following a La Niña phase should lead to an El Niño phase, but this might not always be the case – during June and July 2021 the La Niña broke, but from August La Niña conditions again persisted – and the length of time the ENSO-neutral conditions will hold is also uncertain; this could be as short as one month and as long as three years.

Despite this, there is certainty that an El Niño will happen in the future and with El Niño there is always a concern of drought, particularly during Southern Africa's extended summer wet season of October to March/April.

This is because ENSO has a stronger effect on Southern Africa's weather and climate during summer (particularly November to February), and El Niño more typically brings drought,) as well as hotter than normal conditions, which typically promotes drier conditions. It is, however, important to acknowledge that this is not always, and while most El Niño events are generally associated with drought to varying degrees, the summer of 1997-98 represents an example of when the El Niño did not cause drought.

The worry regarding drought is heightened across Southern Africa because droughts significantly affect our food and water resources, and in line with changing rainfall patterns over Southern Africa, it is expected that drought events could be more devastating, potentially leading to further chances of "Day Zero" events such as that which almost occurred in Cape Town during 2015-17.

In 2015-16 the El Niño caused drought-like conditions where the Vaal Dam's capacity fell to almost 20%, which would compromise the Gauteng province's water supply.

What activities, in this regard, are being undertaken by the ARC's Agrometeorology division?

Through an extensive weather station network, comprising roughly 600 automatic weather stations, as well as the Umlindi newsletter (<https://www.arc.agric.za/arc-iscw/Pages/News-Articles.aspx>), the Agrometeorology division of the ARC's Natural Resources and Engineering is at the forefront of rainfall monitoring across South Africa. In the Umlindi newsletter rainfall characteristics are documented on a monthly basis and are discussed in light of associated vegetation, water resource and wildfire implications to adequately contextualise rainfall patterns. On the other hand, the weather station network provides long-term, reliable, continuous, and real-time weather and climatic data that are essential for efficient management and sustainable use of natural resources, with the main objective of this network being to archive climate information for South Africa as well as supply the agricultural community with weather data to support their decision-making. Furthermore, the division supports numerical modelling capabilities, utilising the Weather Research and Forecasting (WRF) Model for various activities, such as weather forecasting and rainfall monitoring. The main objective of behind this is to supply agriculturally relevant weather and climate information to support decision-making amongst South African farmers.

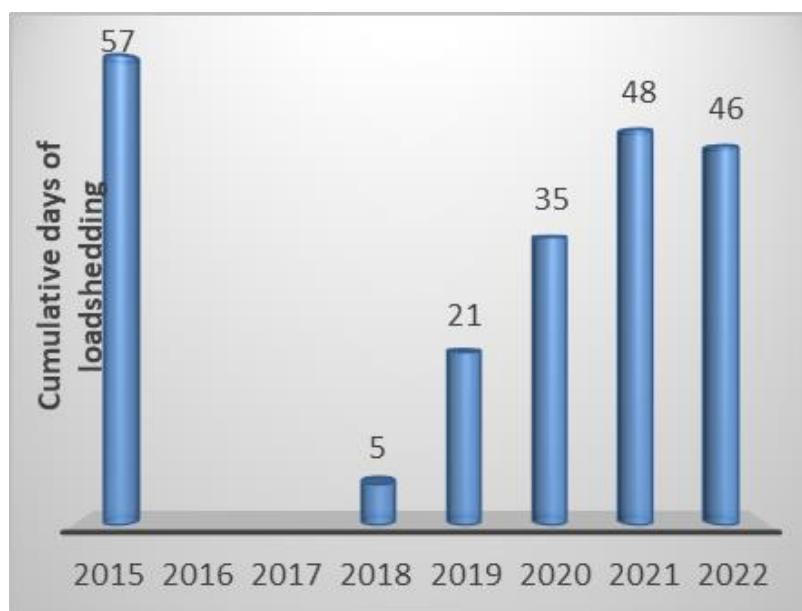
To ensure equal access to weather and climate information to aid decision-making amongst smallholder farmers, the division also conducts workshops in farming communities across the country in local languages. Through these interactive engagements, farmers are trained in climate-smart agricultural practices and are provided information on the upcoming seasonal climate outlooks, as well as historical climate trends. Considering that the climate of South Africa is highly variable both temporally and spatially, information on key agrometeorological variables (e.g., rainfall onset and cessation, wet and dry spells, length of the growing season, etc.) is tailored for each community using long-term climate data from ARC stations installed in those communities. Through these interactions with farming communities, the division gains valuable insights that help shape its research to address relevant challenges induced by climate change and variability, and thereby benefit South African society. In addition to this, researchers in the division are actively undertaking a range of projects that focus on South Africa and directly consider rainfall patterns and aspects of trends and interannual variability thereof. Some of the topics include investigations of variability in drought characteristics and heavy rainfall events in relation to the ENSO, while other topics are exploring rainfall aspects in Global Climate Models for the purpose of guiding future agricultural activities across South Africa.

The article below was written by ARC researchers for Stockfarm Magazine (October 2022) and published online (January 2023):

Renewable energy and energy management, a step in the right direction to minimise farming risks associated with energy insecurity²⁷

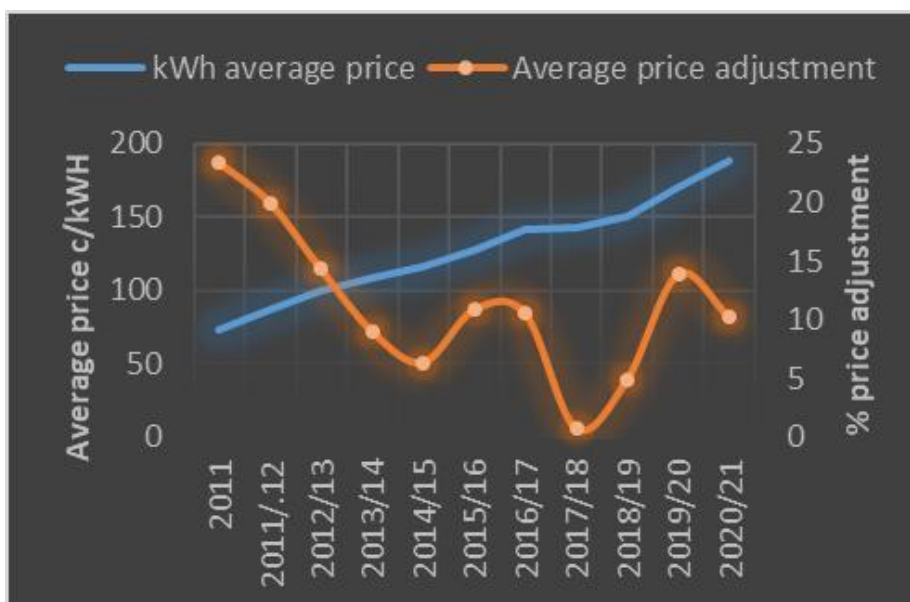
Energy has become an integral part of modern-day intensive farming. Almost every step of the food value chain requires energy as an input, from land preparation right up to the point of consumer consumption. On the farm, energy is consumed directly as fuel or electricity, (e.g. for field machinery, irrigation, heating, cooling, and transportation), and indirectly as fertilizers, chemicals, and animal feed produced off the farm. A major share of energy intake is spent on intensive livestock production with direct energy inputs the feed processing powering of delivery machinery, electricity is used for automated milking, milk storage, water heating and pumping, lighting, ventilation, space heating, and electrical fencing. In South Africa, the two major sources of on-farm energy are electricity and diesel, both of which are primarily obtained from fossil fuels. The production and use of fossil fuels is one of the major contributors to climate change, which negatively affects agriculture.

Over-reliance on these two energy sources presents numerous risks to farmers. Electricity supply, for example, is currently unreliable as Eskom battles to “keep the lights on”, due to aging power plants that need frequent maintenance, and an electricity demand that is fast exceeding the utility’s generating capacity. Barely halfway through the year, there have been more than 46 cumulative days of load shedding in 2022. Additionally, electricity tariffs are increasing rapidly, the graph below shows that the electricity tariff in the agriculture sector has increased by over 200 % in the past decade. Diesel, on the other hand, suffers from price fluctuations driven by geopolitics and volatile currency exchange rates.

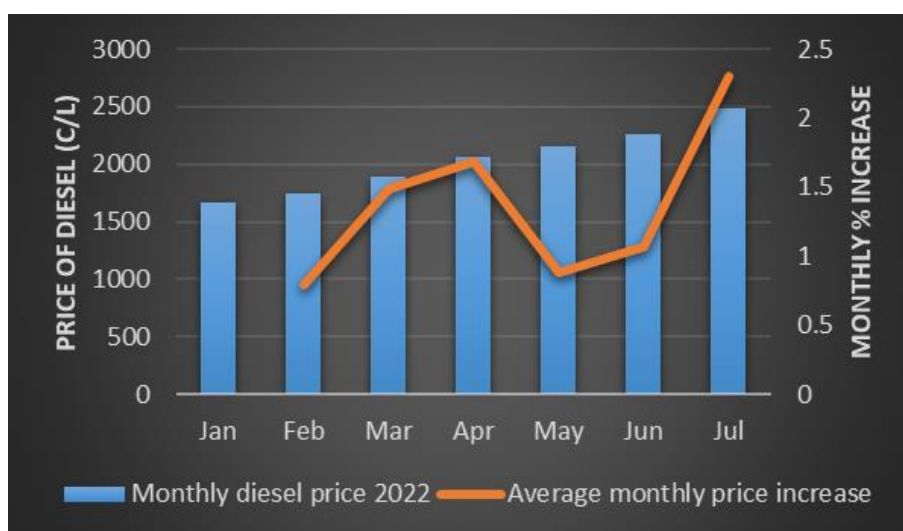


Number of days of load shedding (2015-2022) Source: My Broadband, 2022

²⁷ Available at: <https://agriorbit.com/renewable-energy-and-energy-management-a-step-in-the-right-direction/>



Average tariff price(c/kWh) and annual % increase for the agriculture sector (2011-2021)
(Source: Eskom)



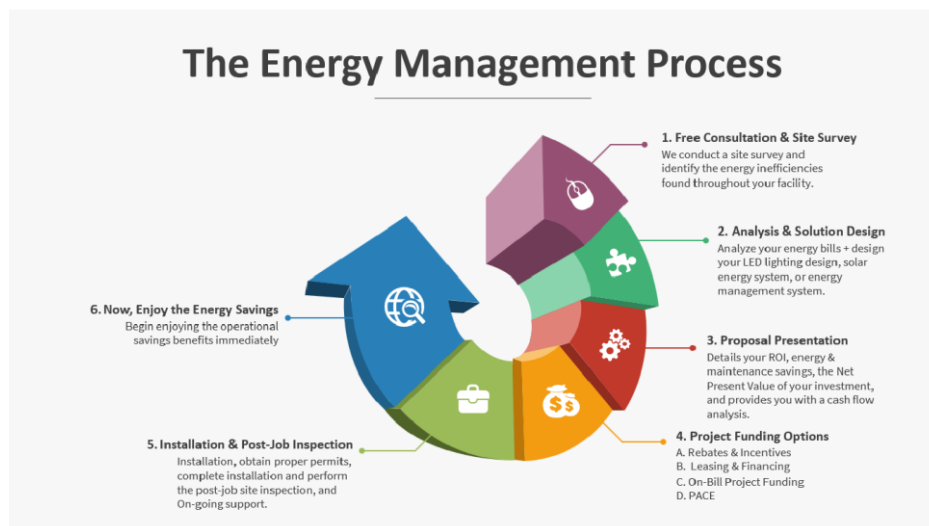
Monthly diesel prices for Jan-July 2022 and monthly % increase
(Source: SAPIA)

The agriculture sector has been severely affected by the frequent power cuts and fluctuating fuel prices experienced in recent years. A recent article in Engineering News highlighted some of the challenges faced by farmers due to load shedding. This includes increased production and labour costs, damage to machinery and irrigation equipment, and disruptions to planting and irrigation scheduling. Post-harvest, disturbances to the cold supply chain are detrimental to perishable produce, as this result in loss of quality, which lowers the selling price, or in extreme cases, retailers reject the produce. On the other hand, poultry farmers have suffered losses caused by chickens dying from the lack of heating or slow growth, due to lack of lighting.

What steps then can farmers take to minimise the impacts of energy insecurity and rising energy bills? The Agricultural Research Council recommends adopting renewable energy technologies coupled with energy management. It is important to implement energy management prior to installing additional/alternative energy sources. Ideally, renewable energy technologies should form part of an overall energy management plan. Energy management is the practice of tracking and optimising energy

performance on a regular, scheduled basis, for a site or building. The objective is to manage consumption, identify energy-saving opportunities, and reduce the energy bill.

Energy management involves carrying out farm energy audits to determine energy consumption patterns, identify big energy users and the critical loads, as well as to establish the energy supply matrix. A tariff audit analysis, which is a free service offered by Eskom, is also an important energy management tool, as it assists a farm in selecting the most appropriate and cost-effective tariff suitable for its electricity usage profile. In some cases, wrong tariffs unnecessarily lead to high-energy costs.



Typical steps in the energy management process
(Source: Efficient Power Tech)

Minimising energy consumption can take many forms, such as installing efficient technology, implementing simple maintenance routines, and sequencing or scheduling operational activities differently to ensure equipment and systems are using energy efficiently and effectively. Another option is “fuel switching”, to replace uneconomical energy sources with those that are more economical, for a given application e.g. swapping electric geysers with solar water heaters.

Once the energy demand is reduced and critical loads identified, additional or backup energy sources can be designed and installed. Fortunately, most farms can deploy a wide range of renewable energy technologies such as wind, solar, and micro-hydro power, due to their remote locations and availability of space. Additionally, farmers can generate renewable energy using organic waste generated in the form, via Waste-to-Energy technologies such as biogas digesters, pyrolysis, gasification, and biomass pelleting. These renewable energy technologies can also be installed as hybrid systems e.g. solar PV + solar thermal+ biogas, which can supply multiple energy forms to meet the farm’s various energy demands e.g. electricity, heat, and gas.

COP 27 DECISIONS RELATING TO AGRICULTURE

Each year there is a United Nations Climate Change Conference to discuss the progress made by countries in fighting climate change under the United Nations Framework Convention on Climate Change (UNFCCC). This annual meeting is termed Conference of the Parties (COP) and the 27th such meeting (COP 27) was held in Egypt in November 2022. South Africa is a signatory to the Paris Agreement and is therefore required to participate, with the Department of Forestry, Fisheries and the Environment as the focal point concerning climate change. The ARC contributes indirectly via a number of projects on determining greenhouse gas emissions from the agricultural sector and other mitigation or adaptation-oriented projects undertaken in the country.



Project report that contributed to the latest national greenhouse gas emission factors in agriculture

There were three major breakthroughs at COP 27 that affect the ARC. The first was the agreement to mobilize funding for developing countries that are hit hard by climate related disasters under the “loss and damage” fund. Secondly, there were significant strides made on adaptation initiatives with over USD200 million new pledges for the adaptation fund. COP 27 also introduced the Koronivia joint work on agriculture which aims at transforming agriculture and food systems to help eliminate food insecurity, malnutrition and poverty.

The ARC supports a holistic climate change research approach that includes a climate-smart focus in the entire agriculture-food value chain, from research on primary production to the commercial supply. It also contributes to greater climate change resilience through improved early warning, decision making, adaptation, mitigation and performance in the agricultural sector in order to improve agricultural output and ensure food security.

ARC’S INVOLVEMENT AND PARTICIPATION IN THE AGRICULTURE AND AGRO-PROCESSING MASTER PLAN (AAMP)

The DALRRD is leading agricultural sector social partners (government, labour, civil society and industry) in the development of an Agriculture and Agro-Processing Master Plan (AAMP). The AAMP aims to provide practical actions and reforms designed to address growth, transformation, employment and developmental challenges in agriculture, food and beverage sectors. The core objectives of the AAMP is the alleviation of unemployment, enhanced food security and substantially increasing growth, transformation and equitable access to means of production to achieve inclusivity in the sector. The

AAMP will guide priorities, interventions, and investments in the sector until 2030, as it outlines the goals and targets to for desired impact to address the sector challenges.

The development of the AAMP has reached the stage of compilation of the first draft action plan with goals and targets. Development of the action plan is led by government and industry in a collaborative manner, through a coordination and negotiation mechanisms of seven (7) clusters. Each cluster has two co-chairs as appointed by the relevant oversight committee. Figure 1 shows the AAMP negotiation structure according to DALRRD's AAMP's draft action plan with goals and targets (2021).

There are two main structures responsible for the coordination of AAMP research, stakeholder consultations and drafting of documents, including the approval of the Plan. The Executive Oversight Committee is chaired by the Minister and includes government senior officials at national and provincial level, labour and civil society leaders and industry representatives for commercial and emerging agriculture. ARC is not represented in this structure, although NAMC is represented.

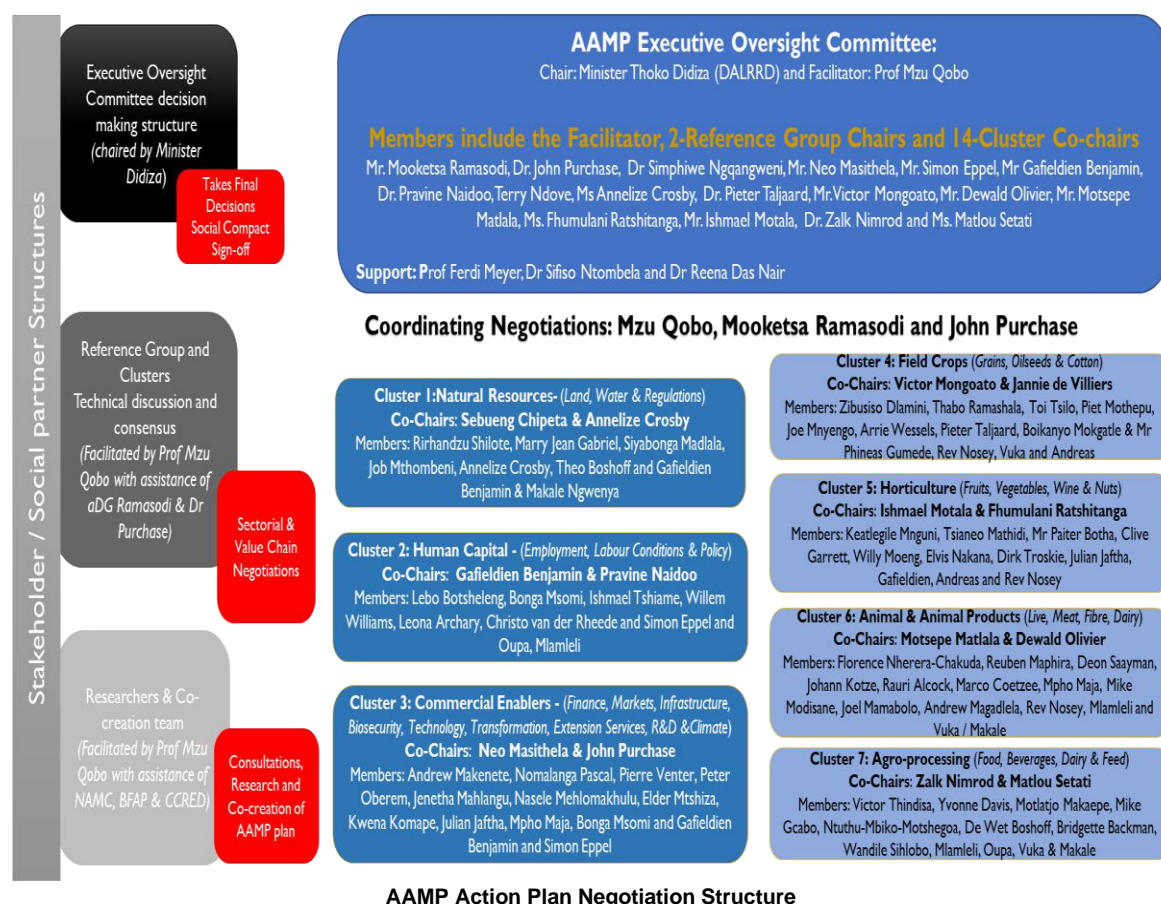
The next level comprises two-negotiation reference structures i.e. (i) Sectoral level focusing on cross-cutting measures such as land, water, labour, infrastructure, finance, biosecurity, transformation and policy and legislative reforms in the agriculture and agro-processing sectors; and (ii) Commodity value chain level focusing on commodity value chains. Various commodities are clustered into four (i.e., field crops, horticulture, animals and animal products and agro-processing) working streams guided by the type, structure and operations of each commodity selected. The functions of the reference groups are outlined as follows:

- Negotiate and reach social partners' consensus on cross-cutting reforms, interventions and commitments required to unlock growth, jobs and development in agriculture and agro-processing sectors;
- Negotiate and reach social partners' consensus on value chains specific reforms, interventions and commitments required to unlock growth, jobs and development in in agriculture and agro-processing sectors; and
- Discuss and reach consensus on indicators and goals to track progress of the AAMP.

Respective cluster sessions have been conducted to solicit input from participants towards the development of first draft action plan with goals and targets against six (6) key pillars of the AAMP. The six (6) pillars represent proposed crosscutting interventions, reforms and commitments that are made by all partners (government, industry and labour) as commitment to ensure the success of the AAMP and ensure accountability of all partners towards attainment of targets and action plans for the proposed interventions. The pillars are:

- a) Pillar 1: Resolving policy ambiguities and creating investment friendly climate
- b) Pillar 2: Creating enabling infrastructure
- c) Pillar 3: Providing Comprehensive farmer support, developmental finance, R&D, and extension services
- d) Pillar 4: Food security, expanded production, and employment creation
- e) Pillar 5: Enabling markets expansion, improving market access, and trade facilitation
- f) Pillar 6: Developing localised food, import replacement, and expanded agro-processing exports

AAMP Action Plan: Negotiation structure



AAMP Action Plan Negotiation Structure

ARC overall involvement

The ARC has been involved since 2020 in the development of the AAMP and continues to play an active role in the process, together with other state-owned entities in the sector. This report consolidates the involvement and participation of different ARC divisions in the AAMP process. The ARC's Plant Sciences and Animal Sciences Group are represented at a high level in the AAMP Negotiation Structure.

DIVISIONAL SPECIFIC INPUTS

Animal Sciences Division

The ARC Animal Sciences Division has been involved in various stages of this initiative, from conception to the multiple stages that have thus far been implemented. In addition to envisaged roles in the implementation of many of the goals of the initiative, the Animal Sciences is currently involved with negotiating and reaching social partners' consensus on value chains specific reforms, interventions, and commitments required to unlock growth, jobs, and development in the animal agricultural and agro-processing sectors. The Animal Sciences Division is represented by Dr. Andrew Magadla, Dr. Dan Motiang, and Prof Norman Maiwashe. In addition, the ARC contributes to the six pillars representing crosscutting interventions, reforms, and commitments that are made by all partners (government, industry, and labour) as the commitment to ensure the success of the AAMP and ensure accountability of all partners towards attainment of targets and action plans for the proposed interventions as follows:

Pillar 3: Providing Comprehensive farmer support, developmental finance, R&D and extension services

The ARC Animal Sciences support Pillar 3 by providing the following scientific services to livestock farmers:

- a) **Information dissemination services** in the form of training on all aspects of livestock value chain, farmer's days and popular publications
- b) **Animal recording and improvement services** through the *National Improvement Schemes* for commercial farmers and *Kaonafatso ya Dikgomo Scheme* for smallholder farmers.
- c) **Diagnostic and Analytical services** such as feed and food and animal health tests
- d) Various **Research and Development and support services** to enhance competitiveness and resilience of the livestock sector in view of climate change and other emerging agricultural threats such as provision of vaccines and models to help farmers make decisions to help them cope with climate change effects
- e) Various animal health research and development and service delivery tools such as vaccines and diagnostic kits

Business performance against the above activities will be tracked using the following output indicators as part of the quarterly reporting process:

- Number of farmers trained
- Number of farmers participating in the national animal improvement schemes
- Number of smallholder farmers participating in Kaonafatso Ya Dikgomo (KyD)
- Number of tests performed for food and feed and animal health
- Number of vaccines produced

Pillar 4: Food security, expanded production, and employment creation

The ARC Animal Sciences support Pillar 4 by providing the following scientific services to livestock farmers and conducting research and development on new and improved livestock production practices to enhance production to ensure food and nutrition security.

Business performance against the above activities will be tracked and monitored using the following output indicators as part of the quarterly reporting process:

- Number of scientific publications
- Number of popular publications
- Number of farmers participating in the livestock improvement schemes and KyD

Pillar 5: Enabling markets expansion, improve market access and trade facilitation

The ARC Animal Sciences support Pillar 5 by organising village livestock auctions to facilitate market access to communal farmers in partnership with the PDA, Community Livestock Associations and Commercial Auction Houses

Business performance against the above activities will be tracked using the following output indicator as part of the quarterly reporting process:

- Number of livestock auctions presented

Pillar 6: Developing localised food, import replacement and expanded agro-processing exports

The ARC Animal Sciences support Pillar 6 by conducting research and development on new and improved livestock production practices to enhance production and production to ensure food and nutrition security

Business performance against the above activities will be tracked using the following output indicators as part of the quarterly reporting process:

- Number of scientific publications
- Number of farmers participating in the animal improvement schemes

Impact and Partnerships

Impact and Partnership signed a cooperation agreement with NAMC in October 2021 to enable them to work together, providing research capacity in the implementation of the Comprehensive Land Agrarian Strategy (CALAS) and AAMP operations, including training farmers on state land. Under this agreement, the NAMC transferred R481 500 to the ARC's Economic Analysis Unit to conduct a Skills Audit for 275 farmers on the State Land Allocation Project. It is expected that the next phase of this project will involve a skills audit for up to 600 farmers.

Pillar 1: Resolving policy ambiguities and creating investment friendly climate

"Transfer PLAS farms and newly acquired state land to deserving beneficiaries". The Agrimetrics unit can play a role in using the ARC PLAS database and conducting new farm assessment surveys to establish deserving beneficiaries, according to agreed criteria, and can monitor progress using the Farm Assessment Toolkit.

Pillar 3: Providing Comprehensive farmer support, developmental finance, R&D and extension services

Improve market access and trade facilitation, the Economics Unit will facilitate integration of gender and youth inclusiveness in R&D programmes, and conduct gendered market-based assessments to provide recommendations on enhancing access to existing and potential markets for farmers, and participation of women and youth in the commodity value chains and markets. The ARC training aimed at extension officers and farmers will include gender awareness training.

Pillar 4: Food security, expanded production, and employment creation

Revitalise PLAS for suitable production of various commodities. Agrimetrics could contribute by utilising our PLAS assessment database and FAT to inform said revitalisation of the PLAS, using the toolkit as well as facilitating the extensive expertise and experience of the ARC in these commodities.

Pillar 5: Enabling markets expansion, improve market access and trade facilitation

Improve market access and trade facilitation, the Economics Unit will facilitate integration of gender and youth inclusiveness in R&D programmes, and conduct gendered market-based assessments to provide recommendations on enhancing access to existing and potential markets for farmers, and participation of women and youth in the commodity value chains and markets. The ARC training aimed at extension officers and farmers will include gender awareness training.

Crop Sciences Division

The Crop Sciences Division has been involved in a number of the cluster engagements, aimed to solicit input from participants towards the development of first draft action plan with goals and targets against six (6) key pillars of the AAMP outlined in the introduction. Considering the broad scope of work covered by each of the seven (7) clusters of the AAMP, the ARC has strived to participate in as many as possible cluster engagements.

The GE: Crop Sciences and some Senior Managers have participated in the Field Crops and Grains cluster meetings by virtue of the food security mandate associated with grains sector. Feedback on engagements in the other clusters is through collaborative engagements with other partners and participants.

The frequency of engagements of the AAMP cluster meetings enable the GE: Crop Sciences to participate in the Field Crops and Grains cluster meetings by virtue of the food security mandate associated with grains sector. Feedback on engagements in the other clusters is through collaborative engagements with other partners and participants.

To date the inputs that have been made on all the six (6) pillars of the AMMP by the field crops and grains sector. These inputs will be submitted to the broader coordination team in order to allow cross-referencing across the work of the respective clusters.

Opportunities for additional ARC involvement

As indicated previously, the ARC is not represented in the Executive Oversight Committee, where other state-owned entities are involved. The ARC is also not represented in the Natural Resources Cluster, the Horticulture and Agro processing clusters, despite having given inputs. These are areas where the ARC has capacity to add value and should thus be represented as members. In addition, the involvement will also strategically position the ARC to influence the decisions on allocation of resources for the implementation of the AAMP.

4.2. INTERNAL ENVIRONMENT ANALYSIS

INSTITUTIONAL REVIEW AND IMPLICATIONS FOR ARC

South African science, engineering and technology institutions (SETIs), including the ARC, are mandated to conduct institutional reviews at five-year intervals. The last review commissioned by the ARC was in 2015, and the report was published in 2016. In line with the mandated timeline, the 2021/22 review of the ARC has been commissioned to ascertain the extent to which the ARC is meeting its mandate, mission and objectives as outlined in the Agricultural Research Act, 1990 (Act no. 86 of 1990 as amended in 2001).

The 2021/2022 Review was conducted in two phases. Phase I, the “Review of Reviews”, and Phase II, the Institutional Review.

Phase I Review of Reviews: The Review of Reviews focused on determining the attainment, progress towards implementation and contextual arguments in addressing the ARC Institutional Review Recommendations of 2015. Phase I informs the line of enquiry and findings with the broad areas/clusters of focus of the Phase II Review, which are intentionally broad, emphasising the integrated and interlinked nature of the ARC's mandate and business. These areas are i) *mandate, priority areas and strategy*; ii) *governance, management, structure and institutional arrangements*; and iii) *quality and relevance of science*. This Phase was completed from December 2021 to January 2022 and provided distinct direction to inform Phase II of the Review.

Phase II Review: Phase II assessed the extent to which the organisation's predetermined objectives and targets—as outlined in the five-year and annual strategic plans covering the period 2015 to 2020—have enabled the organisation to fulfil its mandate, particularly from the perspective of planning, implementation and monitoring. The findings from Phase II will guide the organisation's critical redirection, re-visioning and repositioning. The main focus areas of the review was structured around three thematic areas, namely: *Theme 1: Mandate, Priority Areas and Strategy*; *Theme 2: Governance, management, structure and institutional arrangements* and *Theme 3: Quality and Relevance of Science* (a summary of the focus areas are captured as Annexure 1). Phase II involved twelve independently appointed review panel members (Annexure 2 provides details of members) coupled with a detailed document review and a series of stakeholder (Annexure 3 provides a list of organisations) interviews/engagements conducted. There was in total 24 engagement sessions held, which collectively amount to 48 hours, held over a 9 days. Furthermore, these engagements were predominantly held via an on-line platform (Ms Teams), which allowed for broader group engagements, i.e. more than one individual per organisation, as well as conducting combined sessions.

HIGH LEVEL RECOMMENDATIONS

It should be noted that the recommendations contained in the final report has at the time of compiling this overview, not been formally tabled and approved at a full ARC Council sitting as this is anticipated to occur towards the end of August 2022.

Be that as it may, the table below outlines some key high-level recommendations that has been extracted from the main report, which has a direct bearing on the ARC stakeholder/partnership relations, as well as its strategic research approach towards research, development and innovation for the sector. In no particular order of priority, the high-level recommendations entail:

Clearly articulate a strategy and activity portfolio in line with the ARC mandate
Addressing the challenges of inclusivity and transformation
Leverage the uniqueness, niche and competitive advantage of the ARC
The ARC output and research agenda to be redefined along client-oriented and strategically important megatrends
Embedding gender, intersectionality and Equity Diversity and Inclusivity (EDI)
Pursuing a 'centres of excellence' (CoE) model that highlights relevance and quality needs
Urgently focus on revitalisation and improvement of systems and processes
Undertaking a detailed assessment on the adequacy of resources
Leveraging partnerships in line with the ARC mandate for purposes of resourcing, knowledge sharing and impact
Communication, branding and marketing
Improving the ARC's contribution to human capabilities (specific focus on Professional Development Programme -PDP

WAY FORWARD AND ORGANISATIONAL COMMITMENT

The ARC has developed a strategic coordinated approach, led by the ARC Council, for the implementation of the review findings (both current and prior ones that may not have been adequately addressed). The involvement and commitment of all ARC stakeholders would be key for the anticipated turn-around of the ARC in realigning its focus towards a more inclusive and responsive R&D approach for the agriculture sector.

DRIVERS FOR RESEARCH AND INNOVATION

CROP SCIENCES

A report from the World Government Summit in 2018 (Agriculture 4.0 – The Future of Farming Technology) identified four main developments placing pressure on agriculture in meeting the demands of the future, namely: demographics, scarcity of natural resources, climate change, and food waste. The report states that food demand is continuously growing and by 2050 the world must produce 70% more food within the context where agriculture's share of global GDP shrunk to 3%, which is 66% less than the contribution of a decade ago.

An estimated 800 million people worldwide still suffer from hunger, and it is estimated that by 2030 at least 8% of the world's population (estimated 650 million) will still be undernourished and hungry. The fact is that South Africa's hunger problem is turning into a major health crisis as an estimated one in ten people go hungry every day and malnutrition levels are high and rising. On the other hand, lifestyle diseases associated with obesity are sharply increasing. Estimated that over 9 million children in South Africa are fed under the school feeding schemes every day, which represents the only meals that they have daily.

This situation is exacerbated by the climate crises experienced worldwide, where the impacts of climate change are having devastating effects all over the world annually. The predictions for the next twelve months are indicative of weather disruptions with droughts in some parts and expected high rainfall and flooding in others. The latest International Panel on Climate Change (IPCC) Assessment Report (AR6)

has recently been released. In terms of the outlook for South Africa, expected trends through the 21st century remain like those associated with the previous assessment report (AR5) and this includes predictions for a continued warming trend through the 21st century, exacerbated in the presence of higher atmospheric carbon dioxide concentrations as well as the fact certain parts will become drier over time. Over and above the projected change in mean annual rainfall, there are also indications that the length of the dry season over the summer rainfall region may extend as the result of a later advent of the summer rainy season on average. The projected changes in temperature and rainfall will have implications for both dryland and irrigated cultivation of crops, hence higher temperatures will cause increase in marginal areas (the warmer, drier parts) which could become unsuitable for crops that are currently produced in those areas, whilst such crops may be produced in areas that are currently less suited because the temperatures are too low. Over the winter rainfall region, irrigation water and rainfall for dryland production of grains may become scarce as the region is expected to become more arid. It is therefore important that agricultural research should focus on the development and implementation of climate-smart technologies towards establishing sustainable and resilient food systems in the region whilst acknowledging that solutions are context specific within each region and country.

Crop production is under significant pressure due to continuously rising input costs and climate variance that jeopardise financially viable yields.

Science and technology development must address these challenges to ensure a sustainable farming sector for the future. Innovations and agricultural technologies in crop sciences must improve competitiveness and productivity of crop production through the development of crops/ crop varieties and cropping/production systems that will result in the availability of affordable, safe, and healthy food while ensuring environmental and economic sustainability. Increased focus on sustainable food systems for increased resilience and increased focus on scaling of technologies for impact.

ANIMAL SCIENCES

The Animal Sciences Division is a combined undertaking of the Onderstepoort Veterinary Research (OVR) and the Animal Production (AP). The Division's research and service delivery efforts are directed at the social and economic development of the entire livestock chain, which is a key factor in South Africa's social and economic development. The specific objective of the Division is to advance the productivity, production, competitiveness, and sustainability of the livestock industry. This is achieved through scientific research, human capital development and implementing new and improved technologies for animal production, veterinary science, and animal products. In terms of emphasis, most of the activities of the Animal Sciences Division aligns with ARC Outcomes 1, 2 and 3. In other words, the activities of the Animal Sciences Division seek to advance the livestock sector to be world class in terms of environmental sustainability as well as ethical animal husbandry practices from primary production to processing animal products for human consumption and the use in various industries.

However, the efforts of the Division to deliver on its mandate are plagued by procurement challenges attributable, in the main, to human capacity challenges. This has affected implementation of contract research and thus external income efforts. An organisation-wide plan to turnaround SCM has been promised and this is eagerly anticipated by the Division.

Continued power outages due to cable theft and Eskom load shedding are creating a high risk for loss of research material stored in freezers. The Division has to rely on back-up generators to address the power shortages, which is having a negative impact on operational budget due to large volumes of diesel that is bought and frequent breakdown because these back-up generators are not designed to run for long periods of time. The Division has applied to the City of Tshwane to be exempted from load shedding.

Until these challenges have been overcome the Division will struggle to assist the ARC to deliver on its mandate. The Division will however strive to support the livestock industry with its research and development and service delivery efforts despite the challenges that it is experiencing at the moment.

IMPACT & PARTNERSHIPS

The Impact and Partnerships division aims to foster internal ARC collaborations and external partnerships (national and international) in order to scale up the ARC's R&D outputs, for visible, measurable impact in the agricultural sector. The work of business units in I&P spans the entire R&D value chain, starting with enabling the invention, facilitating translation, and spearheading dissemination, adoption and use of ARC technologies. The ARC's 2022 Institutional review report identified bottlenecks and opportunities in several key areas that are delivered under the I&P division. The divisional priority focus areas for 2023's annual performance plans will enable the ARC to implement some of the recommendations from the institutional review and facilitate delivery of the sustainability and turnaround plan.

The priority areas include the following; (i) implementation of ARC's Commercialisation Strategy, (ii) implementation of the Marketing Strategy, (iii) implementation of the Strategy For Farmer And Value Chain Development, Training, and Support, (iv) Partnerships' development, revitalisation and strengthening, (v) Facilitating increased R&D collaboration across the ARC through the Intercampus Research Forum, (vi) Mainstreaming gender and inclusion, and socio-economic analysis into ARC's R&D programmes, and (vii) increased efforts to generate external revenue. Key outcomes will include increased visibility for ARC, enhanced access by the sector to ARC's R&D outputs for uptake and commercialisation and repositioning of ARC as a preferred R&D strategic partner which provides thought leadership locally and internationally.

REFLECTION ON 4IR: ARC IN CONTEXT

In advancing the Fourth Industrial Revolution (4IR) agenda for South Africa (SA), the Presidential Commission on the Fourth Industrial Revolution (PC4IR) released its 2020 report which guides the country on its response to the opportunities and challenges that may be posed by the 4IR. Furthermore, during December 2022 the DCDDT launched the National Artificial Intelligence Institute in collaboration with the University of Johannesburg and Tshwane University of Technology. The new multi-stakeholder institute will include projects such as AI for the mining industry, the construction of a large government data cloud, AI for motor industry infrastructure enhancements, modernising public services, digital farming and AI-enhanced food production. The ARC in its 2020/21 ICT Business Strategy has confirmed a commitment to deploy some of the emerging technologies. There has been pilot implementation of the 4IR technologies in projects such as the CSIR-ARC-DSI Precision Farming wherein AI/ML, big data analytics, satellite imagery and Internet of Things are incorporated. One of our mobile applications is deploying the AI's computer vision capabilities which will allow the App users to capture pictures into the App for animal diseases diagnosis through the App with limited human intervention. The ARC has more than 40 applications to enhance the smallholder farmers' productivity through apps such as Maize Information Guide, Rain 4 Africa, and Fall Army Worm. There is an expressed interest to deploy blockchain technology for traceability in conjunction with DALRRD. As we position ourselves to meet challenges and take opportunities presented by the 4IR into the 2030s, we must reconsider our ICT Business Strategy to ensure that we can meet the changing business requirements and leverage technological innovations over the next five to ten years.

REFLECTION ON SOLAR: ARC IN CONTEXT

The renewable energy industry focusing on solar generation has grown dramatically, and private & public customers are being persuaded to invest in renewable energy due to the unreliability of Eskom's power provision and the cost of electricity that has become one of the main operational cost drivers. The main benefit of implementing Solar Technology is reducing operating costs, protecting sensitive equipment and infrastructure, continuing business operations and the reduction of the ARC's carbon footprint. The ARC started implementing a few pilot Solar projects in 2019 at Cape Town and

later at Nelspruit campus; however due to the relatively small-scale installations and only being implemented on portions of the infrastructure at the sites it had a negligible impact on the total power usage. Benefits on the projects are cost reduction and stability on the power mini grid. In 2022 approval was granted for Capex investment over the next 7 years to rollout Solar Technology in the ARC. The project started late 2022, prioritising and aligning to higher electrical consumption sites, starting with the highest and most costly power and carbon sites. The project will be concluded in 2029.

ARC RESEARCH FOCUS AREAS

Research-focused areas serve as an organisational 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

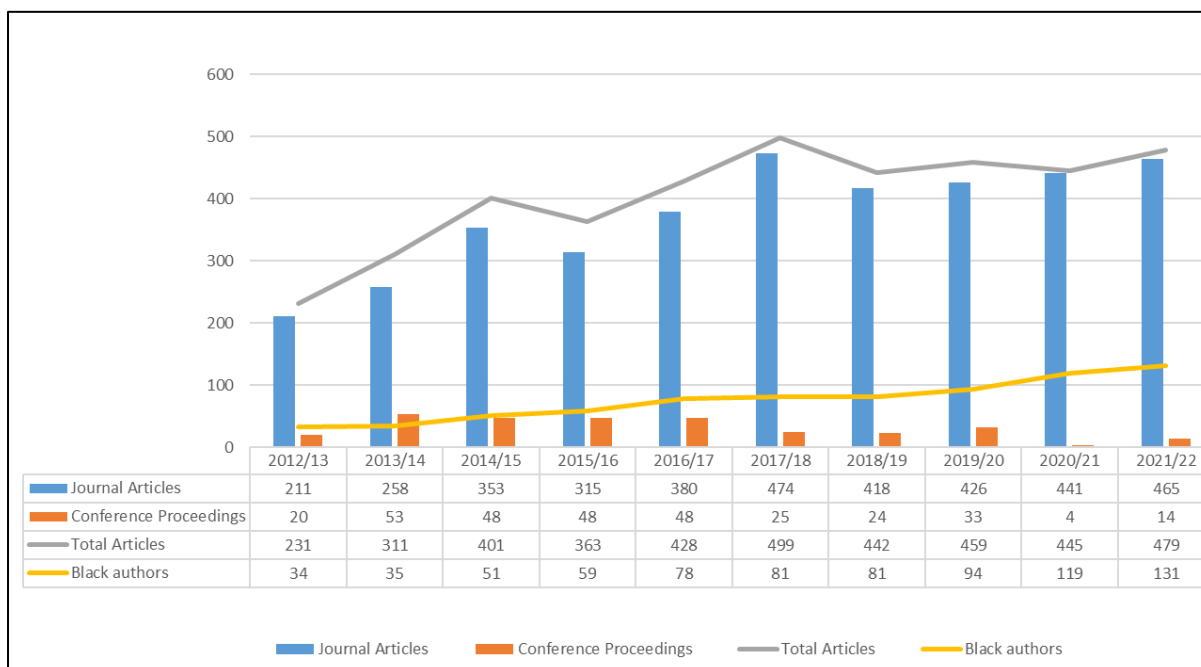
ANALYSIS OF ORGANISATIONAL PERFORMANCE TO INFORM THE FUTURE

Agriculture production and productivity are essential to fulfil the food and nutrition security demands of the population. However, agriculture production and productivity in South Africa is often subjected to a wide range of biotic and abiotic constraints such as soil health, water, temperature, pests and diseases, climate change and other factors of production (e.g. input such as labour, financial resources, technology, skills etc.) to name a few.

Research and innovation serve as the basis to provide scientific solutions for improved yields, productivity and quality of agricultural products throughout the value chain. It is important to note that outcomes of research and development often require long lead periods prior to dissemination, including generating the scientific information and knowledge for better production and productivity.

Trend analysis indicates that the ARC has successfully contributed to the scientific knowledge base of our economy as per peer-reviewed publications emanating from research and development.

In the last 10 years the ARC has more than doubled the number of peer reviewed scientific publications from 231 in 2012/13 to 479 in 2021/22. This includes a significant increase in the number of peer-reviewed publications by previously disadvantaged authors (black scientist as per South African definition) from 34 in 2012/13 to 131 in 2021/22. Further, the ARC achieved these impressive results through research collaborations with a broad range of external partners from domestic and international organisations. Of particular significance is the improved quality of science reflected through publications with ISI rating (impact factor) of 2.0 or better. These peer reviewed scientific publications were achieved to address ARC outcomes 1 to 5. These publications suggest increased likelihood of scientific information that will be utilised towards technology and product development, with greater influence on possible new innovations.



Applications of scientific data, information and knowledge are essential towards developing solutions, technologies and innovation for sustainable agriculture. In this regard, a number of examples are hereby provided demonstrating the success of the ARC in delivering applicable solutions and technologies for the sector.

ARC PROFESSIONAL DEVELOPMENT PROGRAMME (PDP)

South Africa faces skills shortage challenges across various sectors of the economy. The agricultural sector has not been spared from the skills shortage challenges in that several scarce skills have been identified, including agricultural scientists, agricultural engineers, etc., to name a few. The DHA confirmed this in August 2022 when they released the latest list of scarce and critical skills in South Africa.

This skills shortage conundrum has existed for a while. It led to the ARC launching the Professional Development Programme (PDP) in 1996 to attract interest from young graduates from disadvantaged communities in South Africa into the agricultural sector. The focus of the PDP is to train young scientists in these various fields of occupations, thereby building a talent pipeline/pool that the sector can tap into for future generations of scientists.

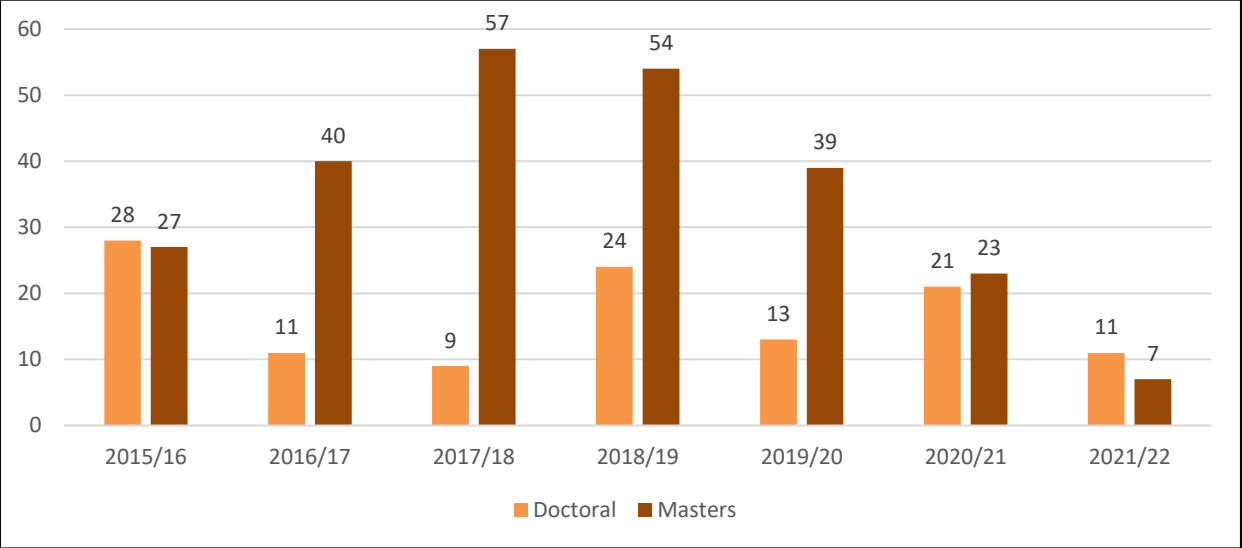
The PDP aims to provide financial assistance and on-the-job training to students registered with any South African university studying toward a master's, doctoral and postdoctoral programme in agriculture and agricultural engineering.

The PDP is structured in a way that it creates an environment in which young researchers are exposed to projects that add value to their studies and allow them to gain insight from world-class supervisors. The programme has successfully enticed, nurtured, and developed scientific knowledge and skills, exposing students and participants to various modalities of agricultural R&D, thereby contributing to the overall mandate of the ARC and South Africa.

To make the PDP to be successful, the ARC realised that it would not manage to embark on this project alone; however, it explored partnerships with other organisations of note geared toward building the Science, Engineering, and Technology (SET) skills in the country in line with the developmental agenda

of the state. These partners include the DSI, the WRC, the National Research Foundation, the Agricultural Sector Education and Training Authority, and the DALRRD.

The PDP is bearing good returns to the ARC and the sector; in the past seven financial years, for example, the ARC has managed to train two hundred and forty-seven (247) master's students and one-hundred seventeen (117) doctoral students who have completed and graduated their different qualifications. The breakdown is detailed below in a graph format.



Review of Students who graduated the past seven financial years (2016 – 2022)

4.3. SUMMARY OF CRITICAL ISSUES INFORMING THE 2023/24 ANNUAL PERFORMANCE PLAN

The following key critical success factors will significantly contribute to the sustainability of the ARC, both at the level of enhancing the ARC strategic positioning within the sector; locally, regionally and internationally; while also enhancing the ARC operational environment with respect to efficiencies and effectiveness across all service level offerings:

- Undertake and finalise a comprehensive review of the ARC current (dated 2019) Sustainability and Turnaround Plan;
- Outcomes from the above review will set the foundation towards the formal institutionalisation and implementation of enhanced strategies/pillars of focus, against which periodic performance and reporting can be initiated and tracked;
- Having completed an Institutional Review process during the previous financial year, the focus for the new financial year would be on the implementation of the review recommendations through an aligned and focused management action/response plan;
- Alignment, support and implementation of key initiatives as contained/outlined under the six key pillars of the approved Agriculture and Agro-Processing Master Plan;
- Adopting a more aggressive approach that is geared towards the tangible realisation of the ARC Commercialisation Strategy;
- An enhanced focus on the development, repackaging and dissemination of sector solutions that are aimed at enhancing the resilience of the sector to plant and animal pests and diseases, climate change and energy constraints;
- The adoption of an accelerated approach towards the achievement of committed strategic outcome areas that are aligned to the ARC 2020/2021 -2024/2025 Strategic Plan, which are informed by the Longer-Range Development Priorities (NDP 2030, SDGs, Agenda 2063, etc.) and National Priorities for the next five years (SONAs, MTSF 2019-2024, Sector Department Priorities, etc.); and
- Enhancing the ARC value proposition towards a strategic partner of choice across the broader agriculture sector for the short to longer term (ARC Vision 2050) time horizon.

PART C: MEASURING OUR PERFORMANCE

The Agricultural Research Council Impact and Outcomes reflected in the 2020-25 Strategic Plan are unpacked in the 2023/24 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) Animal Sciences
3. Improved nutritional value, quality and safety of agricultural products	1) Crop Sciences 2) Animal Sciences
4. A skilled and capable agriculture sector	1) Crop Sciences 2) Animal Sciences 3) Impact and Partnerships
5. Enhanced resilience of agriculture	1) Crop Sciences 2) Animal Sciences
6. A high-performing and sustainable organisation	1) Office of the CEO 2) Human Capital Management 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 2023/24 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		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
1. Increased agricultural production and productivity	Crop Sciences	Crop technologies developed and information dissemination	Number of cultivars registered	9	2	1	11	7	7	7
			Number of field trials	197	311	289	204	182	179	169
			Number of technical reports	267	271	209	174	163	152	149
			Number of cultivar evaluations	0	68	70	39	35	35	36
	Animal Sciences	Animal improvement services	Number of farmers participating in each of the animal improvement schemes	253	190	213	220	150	160	170
			Number of technical reports	0	781	875	1000	540	600	610

ARC OUTCOME 1: Output Indicators, Annual and Quarterly Targets

RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	2023/24 ANNUAL TARGET	QUARTERLY TARGETS			
				Q1 Apr - Jun 2023	Q2 Jul - Sep 2023	Q3 Oct - Dec 2023	Q4 Jan - Mar 2024
Crop Sciences	Crop technologies developed and information dissemination	Number of cultivars registered	7	0	0	0	7
		Number of field trials	182	111	35	22	14
		Number of technical reports	163	22	82	24	35
		Number of cultivar evaluations	35	0	0	4	31
Animal Sciences	Animal improvement services	Number of farmers participating in each of the animal improvement schemes	150	65	35	30	20
		Number of technical reports	540	150	150	120	120

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	74 404
Animal Sciences	26 142
Total expenses:	100 546

Human Resources*

DIVISION	RESEARCHERS	RESEARCH SUPPORT	OTHER SUPPORT
Crop Sciences	318	620	79
Animal Sciences	110	160	43

* Numbers are based on staff complement as of January 2023.

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: 2024 Impact: <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) Animal Sciences.

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 2023/24 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		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
2. Sustainable ecosystems and natural resources	Crop Sciences	Natural Resource Management	Number of technical reports	73	86	82	78	88	88	79
			Number of field trials	52	76	75	59	52	52	48
			Number of services rendered	105	436	780	559	571	583	591
	Animal Sciences	Soil and Water Science	Number of samples analysed for soil health and water quality	481	157	411	144	220	215	228
			Number of technical reports	17	62	42	19	28	29	32
			Number of services rendered	0	488	557	400	410	420	430
		Weed Science	Number of technical reports	0	7	14	12	13	13	13
			Number of services rendered*	10	13	7	5	0	0	0
		Ecosystem services	Number of technical reports	1	11	7	4	4	5	6
			Number of services rendered*	0	7	2	0	0	0	0

*Indicator forms part of the Strategic Plan

ARC OUTCOME 2: Output Indicators, Annual and Quarterly Targets

RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	2023/24 ANNUAL TARGET	QUARTERLY TARGETS			
				Q1 Apr - Jun 2023	Q2 Jul - Sep 2023	Q3 Oct - Dec 2023	Q4 Jan - Mar 2024
Crop Sciences Animal Sciences	Natural Resource Management	Number of technical reports	88	17	27	18	26
		Number of field trials	52	38	1	3	10
		Number of services rendered	571	141	144	142	144
	Soil and Water Science	Number of samples analysed for soil health and water quality	220	50	52	60	58
		Number of technical reports	28	3	8	7	10
		Number of services rendered	410	90	105	105	110
	Weed Science	Number of technical reports	13	0	6	0	7
		Number of services rendered*	0	0	0	0	0
	Ecosystem services	Number of technical reports	4	1	1	1	1
		Number of services rendered*	0	0	0	0	0

*Indicator forms part of the Strategic Plan

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	259 422
Animal Science	10 107
Total expenses:	269 529

Human Resources

DIVISION	RESEARCHERS	RESEARCH SUPPORT	OTHER SUPPORT
Crop Sciences	376	659	93
Animal Sciences	11	1	1

* Numbers are based on staff complement as of January 2023.

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	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

RELEVANT MTSF PRIORITY AND IMPACT	RELEVANT MTSF OUTCOMES AND INTERVENTIONS	DALRRD STRATEGIC PLAN RESPONSE	DSI STRATEGIC PLAN RESPONSE
contributing to 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 	Mineral Resources 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
- 2) Animal 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 2023/24 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		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
3. Improved nutritional value, quality and safety of agricultural products	Crop Sciences Animal Sciences	Broadening the food base	Number of cultivars registered*	61	0	0	4	0	0	0
			Number of field trials	2	5	6	3	7	7	8
			Number of technical reports	125	131	102	69	63	58	55
			Number of cultivar evaluations	0	105	41	64	32	32	33
			Number of new products developed	0	1	0	6	3	3	4
			Number of services rendered	0	16	44	15	24	24	27
		Post-harvest handling and agro-processing	Number of cultivars developed with improved shelf life*	1	0	0	0	0	0	0
			Number of new post-harvest solutions developed	4	2	1	0	2	2	2
			Number of solutions for controlled atmosphere	0	1	1	1	2	2	2
			Number of services rendered	0	59	55	33	28	26	27

*Indicator forms part of the Strategic Plan

ARC OUTCOME 3: Output Indicators, Annual and Quarterly Targets

RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	2023/24 ANNUAL TARGET	QUARTERLY TARGETS			
				Q1 Apr – Jun 2023	Q2 Jul – Sep 2023	Q3 Oct – Dec 2023	Q4 Jan – Mar 2024
Crop Sciences	Broadening the food base	Number of cultivars registered*	0	0	0	0	0
		Number of field trials	7	0	2	2	3
		Number of technical reports	63	8	16	14	25
		Number of cultivar evaluations	32	15	17	0	0
		Number of new products developed*	3	1	0	2	0
		Number of services rendered	24	6	7	5	6
Animal Sciences	Post-harvest handling and agro-processing	Number of cultivars developed with improved shelf life*	0	0	0	0	0
		Number of new post-harvest solutions developed	2	0	0	0	2
		Number of solutions for controlled atmosphere*	2	0	0	0	2
		Number of services rendered	28	7	7	7	7

*Indicator forms part of the Strategic Plan

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); and
- 5) Research into the processes involved in mobilisation 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	40 706
Animal Sciences	1 292
Total expenses:	41 998

Human Resources

DIVISION	RESEARCHERS	RESEARCHER SUPPORT	OTHER SUPPORT
Crop Sciences	196	416	43
Animal Sciences	11	1	1

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; and
- 3) 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 2023/24 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		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
4. A skilled and capable agriculture sector through innovation, knowledge and technologies	Crop Sciences Animal Sciences Impact and Partnerships	Skills development	Number of people trained	525	1 808	1 375	497	542	459	491
			Number of Postgraduate students supported by ARC	30	44	52	46	53	48	46
		Technology Transfer	Number of technologies/IP registered/developed	6	2	2	3	8	7	10
			Number of enterprises supported	0	6	6	5	25	30	30
			Number of technologies transferred under license	0	12	137	30	20	30	30
		Smallholder farmer supported	Number of farmers trained	792	851	1 246	1 004	1 251	1 076	1 096
			Number of technical assessments for commercial readiness	0	25	30	40	50	60	60
			Number of smallholder farmers participating in KyD	3 000	4 834	7 096	4 500	5 000	5 500	6 000
			Number of services rendered	125	191	179	54	104	104	104
			Number of farmer field days	0	5	5	6	11	11	13

Outcome	Responsible Business Division	Output	Output Indicators	Audited Actual Performance			Estimated Performance	Medium-term Targets		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
4. A skilled and capable agriculture sector through innovation, knowledge and technologies	Crop Sciences	Farmer support	Number of farm assessments	0	0	19	25	6	11	13
	Animal Sciences		Number of farmers supported	380	311	420	238	281	286	301
			Number of farmer field days	28	26	37	18	21	22	23
			Impact and Partnerships	Number of services rendered	5	379	112	103	99	103
	Knowledge generated and dissemination	Number of scientific publications	227	446	479	249	288	257	268	
		Number of popular publications	171	317	251	187	204	209	223	
		Number of public awareness events	0	96	187	80	160	162	171	

ARC OUTCOME 4: Output Indicators, Annual and Quarterly Targets

RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	2023/24 ANNUAL TARGET	QUARTERLY TARGETS			
				Q1 Apr - Jun 2023	Q2 Jul - Sep 2023	Q3 Oct - Dec 2023	Q4 Jan - Mar 2024
Crop Sciences Animal Sciences Impact and Partnerships	Skills development	Number of people trained:	542	60	123	162	197
		Number of Postgraduate students supported by ARC	53	8	2	20	23
	Technology Transfer	Number of technologies/IP registered/developed	8	0	2	4	2
		Number of enterprises supported	25	5	10	5	5
		Number of technologies transferred under license	20	0	10	5	5
	Smallholder farmer supported	Number of farmers trained	1 251	242	298	299	412
		Number of technical assessments for commercial readiness	50	12	13	13	12
		Number of smallholder farmers participating in KyD	5 000	1 250	1 250	1 250	1 250
		Number of services rendered	104	25	26	27	26
		Number of farmer field days	11	2	2	2	5
	Farmer support	Number of farm assessments	6	0	1	2	3
		Number of farmers supported	281	20	80	60	121
		Number of farmer field days	21	4	5	5	7
		Number of services rendered	99	22	25	20	32
	Knowledge generated and dissemination	Number of scientific publications	288	59	62	78	89
		Number of popular publications	204	42	49	56	57
		Number of public awareness events	160	35	43	40	42

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	53 618
Animal Sciences	255 475
Impact & Partnerships	6308
Total expenses:	315 401

Human Resources

DIVISION	RESEARCHERS	RESEARCH SUPPORT	OTHER SUPPORT
Crop Sciences	292	636	72
Animal Sciences	245	241	80
Impact & Partnerships	17	3	5

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 provides 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; and
- 2) Animal Sciences.

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 2023/24 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		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
5. Enhanced resilience of agriculture	Crop Sciences Animal Sciences	Climate resilient solutions	Number of climate resilient solutions adopted*	3	3	0	0	0	0	0
			Number of drought tolerant cultivars*	0	0	0	2	0	0	0
			Number of services rendered*	0	6	6	0	12	14	18
			Number of technical reports*	9	31	12	10	6	8	10
			Number of field trials	0	105	107	105	12	13	14
			Number of tools for measuring climate change	0	433	419	400	320	320	320
		Vaccine production	Number of blood vaccine doses produced	241 215	198 052	49 890	65 000	70 000	70 000	65 000
			Number of different types of vaccines developed*	0	0	0	0	1	0	0
			Number of FMD vaccine doses produced*	50 000	0	0	0	0	50 000	100 000
			Number of vaccine clinical trials*	0	0	0	2	1	1	0
		Laboratory services	Number of tests reports issued for animal health	12 416	16 781	22 344	14 208	16 565	17 395	17 718
			Number of tests performed for food and feed	3 000	3 293	3 008	2 310	2 410	2 510	2 612
			Number of services rendered	0	139	231	150	200	220	240
			Number of technical reports	0	13	21	0	18	10	8

*Indicator forms part of the Strategic Plan

ARC OUTCOME 5: Output Indicators, Annual and Quarterly Targets

RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	2023/24 ANNUAL TARGET	QUARTERLY TARGETS			
				Q1 Apr - Jun 2023	Q2 Jul - Sep 2023	Q3 Oct - Dec 2023	Q4 Jan - Mar 2024
Crop Sciences Animal Sciences	Climate resilient solutions	Number of climate resilient solutions adopted*	0	0	0	0	0
		Number of drought tolerant cultivars*	0	0	0	0	0
		Number of services rendered*	12	3	3	3	3
		Number of technical reports*	6	0	0	3	3
		Number of field trials	12	3	2	4	3
		Number of tools for measuring climate change	320	0	0	0	320
	Vaccine production	Number of blood vaccine doses produced	70 000	0	35 000	0	35 000
		Number of different types of vaccines developed*	1	0	1	0	0
		Number of FMD vaccine doses produced*	0	0	0	0	0
		Number of vaccine clinical trials	1	0	0	0	1
	Laboratory services	Number of tests reports issued for animal health	16 565	3 835	4 440	4 195	4 095
		Number of tests performed for food and feed	2 410	602	602	602	604
		Number of services rendered	200	60	40	60	40
		Number of technical reports	18	2	4	2	10

*Indicator forms part of the Strategic Plan

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	3 791
Animal Sciences	469 030
Total expenses:	472 821

Human Resources

DIVISION	RESEARCHERS	RESEARCH SUPPORT	OTHER SUPPORT
Crop Sciences	163	259	37
Animal Sciences	245	241	80

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
Priority 1: Building a capable, ethical and developmental State: <u>2024 Impact:</u> <ul style="list-style-type: none"> Public value and trust Active citizenry and partnerships in society 	Outcome 1: Improved governance and accountability: <ul style="list-style-type: none"> Strengthen the governance system of state owned entities Outcome 2: Functional, efficient and integrated government: <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 Outcome 3: Professional, meritocratic and ethical public administration: <ul style="list-style-type: none"> Programme for building a professional public administration Outcome 4: Social compact and engagement with key stakeholders: <ul style="list-style-type: none"> Participatory governance mechanisms and citizen engagement Outcome 5: Mainstreaming of gender, youth and disability, empowerment and development institutionalised: <ul style="list-style-type: none"> Implementation of gender, youth and disability responsive planning, budgeting, interventions, policies and legislations 	Outcome 1: Improved governance and service excellence: <ul style="list-style-type: none"> Compliance with legal prescripts Achievement of KPIs Payment of suppliers in 30 days Compliance to performance management framework 	A Capable, Ethical and Developmental State: <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 Strengthened government capability to deliver on the developmental agenda: <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 Capital Management;

- 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 2023/24 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		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
6.A high-performing and sustainable organisation	ICT & Infrastructure	Infrastructure Management	Number of business cases implemented for assets management	4	1	3	1	2	3	3
			Increase in Rand value of rental income	3%	3.48%	3.25%	1%	2%	5%	5%
		ICT Strategy Implementation	Number of digital transformation projects implemented	Not measured	Not measured	5	3	3	3	3
			Number of stabilisation projects implemented	Not measured	Not measured	4	2	2	1	1
			Number of optimisation projects implemented	Not measured	Not measured	4	3	3	3	3
	Human Capital Management	Human resources Management	Vacancy rate	Not measured	9.72%	12.8%	10%	5%	5%	5%
			Support employees as percentage of total staff	Not measured	22.70%	19.8%	16.70%	20%	20%	20%
			Percentage increase of employment equity ratio in the designated groups in core business, in respect of: -Women at Senior Management level	Not measured	46%	46%	46%	46%	46%	46%
			- People with Disabilities employed	Not measured	0.57%	0.51%	1.55%	1%	1%	1%

OUTCOME	RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	AUDITED ACTUAL PERFORMANCE			ESTIMATED PERFORMANCE	MEDIUM-TERM TARGETS		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
6. A high-performing and sustainable organisation	Human Capital Management	Performance management	Improve the leadership dimensions of 360 degree results of Management, Senior and Executive Management	Not measured	3.42	3.45	4	4	4	4
			Alignment of organisational values	Not measured	93.51%	96%	100%	90%	90%	90%
			Percentage implementation of change management strategies linked to culture survey and 360 degree leadership processes	Not measured	Culture survey completed	96%	100%	100%	100%	100%
		Human resource development	Number of employees appointed with Masters degrees	20	8	5	20	20	20	20
			Number of employees appointed with Doctoral degrees	10	9	15	10	10	10	10
			Number of employees with Masters degrees	268	199	187	200	200	200	200
			Number of employees with Doctoral degrees	240	232	238	240	240	230	230
			Percentage staff turnover	3.50%	3.32%	4.61%	3.5%	4%	4%	4%
			Total spend on PDP stipend and registration	R 21.1mil	R 8.85 mil	R 5.8 mil	R 21.1 mil	R 10 mil	R 20 mil	R 10 mil
			Training spend as a % of salary bill	2%	0.4%	1%	1%	1%	2%	2%

OUTCOME	RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	AUDITED ACTUAL PERFORMANCE			ESTIMATED PERFORMANCE	MEDIUM-TERM TARGETS		
				2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
6. A high-performing and sustainable organisation	Impact and Partnerships	Commercialisation of ARC solutions	Establishment of an ARC commercialisation entity	Not measured	Not approved	0	Entity Established	Registration of the entity, establishment of 2 spin-offs		
		Exhibitions and sponsorships	Number of exhibitions, sponsorships	Not measured	0	0	5	8	5	5
		International partnerships	Number of new international partnerships	Not measured	2	2	2	2	2	2
	Finance	Governance	Audit opinion	Not measured	Qualified opinion	Qualified opinion	Unqualified audit	Unqualified audit	Unqualified audit	Unqualified audit
		Funding and revenue generation	Zero Deficit	Not measured	Zero deficit	Zero deficit	Zero deficit	Zero deficit	Zero deficit	Zero deficit
			BBBEE rating	Level 6	Level 8	Level 8	Level 5	Level 1	Level 1	Level 1
			External income as % of total revenue	Not measured	21%	20%	35%	28%	28%	27%
			Rand value of royalty income	R 17 mil	R 39 mil	R 35 mil	R 23 mil	R 40 mil	R 42 mil	R 42 mil
		Cost efficiencies	Reduction in fixed cost	Not measured	1%	(2%)	5%	5%	5%	5%
			Personnel costs as % of Operational PG	Not measured	91%	70%	75%	57%	56%	56%

ARC OUTCOME 6: Output Indicators, Annual and Quarterly Targets

RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	2023/24 ANNUAL TARGET	QUARTERLY TARGETS			
				Q1 Apr - Jun 2023	Q2 Jul - Sep 2023	Q3 Oct - Dec 2023	Q4 Jan - Mar 2024
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	2%	Annual Target			
	ICT Strategy Implementation	Number of digital transformation projects implemented	3	Annual Target			
		Number of Stabilisation projects implemented	2	Annual Target			
		Number of Optimisation projects implemented	3	Annual Target			
Human Capital Management	Human resources Management	Vacancy rate	5%	Annual Target			
		Support employees as percentage of total staff	20%	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%	Annual Target			
	Performance management	Improve the leadership dimensions of 360 degree results of Management, Senior and Executive Management	4	Annual Target			
		Alignment of organisational values	90%	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	200	Annual Target			
		Number of employees with Doctoral degrees	240	Annual Target			
		Percentage staff turnover	4%	Annual Target			
		Total spend on PDP stipend and registration	R 10 mil	Annual Target			
		Training spend as a % of salary bill	1%	Annual Target			

ARC: Annual Performance Plan 2023/24

RESPONSIBLE BUSINESS DIVISION	OUTPUT	OUTPUT INDICATORS	2023/24 ANNUAL TARGET	QUARTERLY TARGETS			
				Q1 Apr - Jun 2023	Q2 Jul - Sep 2023	Q3 Oct - Dec 2023	Q4 Jan - Mar 2024
Impact and Partnerships	Commercialisation of ARC solutions	Establishment of an ARC commercialisation entity	Registration of the entity, establishment of 2 spin-offs	Annual Target			
	Exhibitions and sponsorships	Number of exhibitions, sponsorships	8	2	2	2	2
	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 1	Annual Target			
		External income as % of total revenue	28%	Annual Target			
		Rand value of royalty income	R 40 mil	Annual Target			
		Reduction in fix cost	5%	Annual Target			
	Cost efficiencies	Personnel costs as % of Operational PG	57%	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.

ARC OUTCOME 6: RESOURCE CONSIDERATIONS

Financial Resources

DIVISION	AMOUNT IN R '000
Human Capital	23 003
Finance	24 192
ICT and Infrastructure	70 636
Office of the CEO	47 550
Assurance Providers	12 136
Personnel and other related costs	178 105
Total expenses:	355 622

Human Capital

DIVISION	ADMINISTRATION & SUPPORT
Human Capital	40
Finance	107
ICT and Infrastructure	38
Impact and Partnerships	25

6. THE ARC FINANCIAL PLAN AND ANNUAL BUDGET FOR 2023/24 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's outlined below:

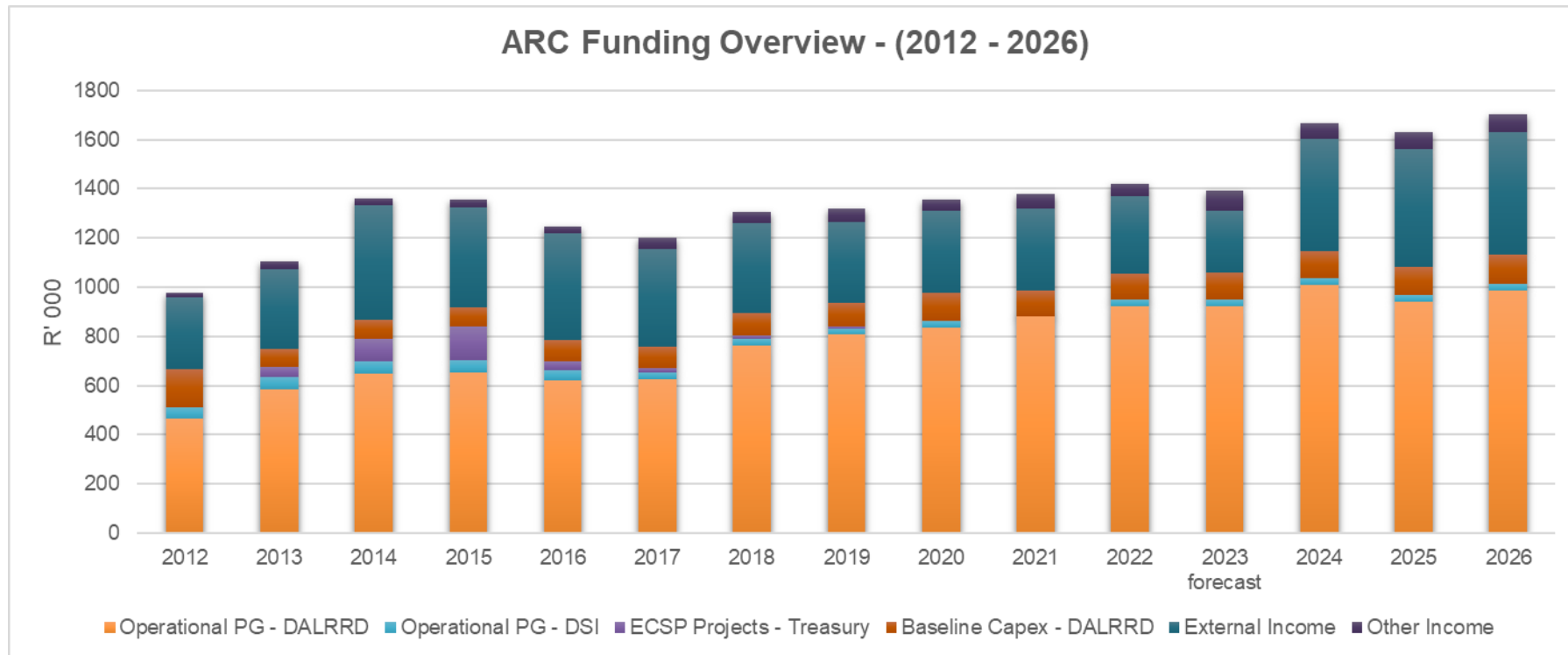
The Agricultural Research Council Act of No 86 of 1990, provides wider options for the financing of the ARC which includes, inter alia, the following: (a) Money appropriated by Parliament to finance the functions of the ARC; (b) Money paid to the ARC arising from the sale on an end-product of research, 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 economy is currently characterised by numerous challenges such as the: sluggish economy; the growing budget deficit and debt burden; a growing number of state-owned entities, which require government bailout. It is against this backdrop that the money appropriated by Parliament, through the parliamentary grant, are forecasted to increase at a rate below inflation over the MTEF period.

The ARC has prepared its financial plan based on a parliamentary grant allocation letter received from DALRRD in December 2022.

PROJECTED REVENUE FOR 2023/24 MTEF PERIOD

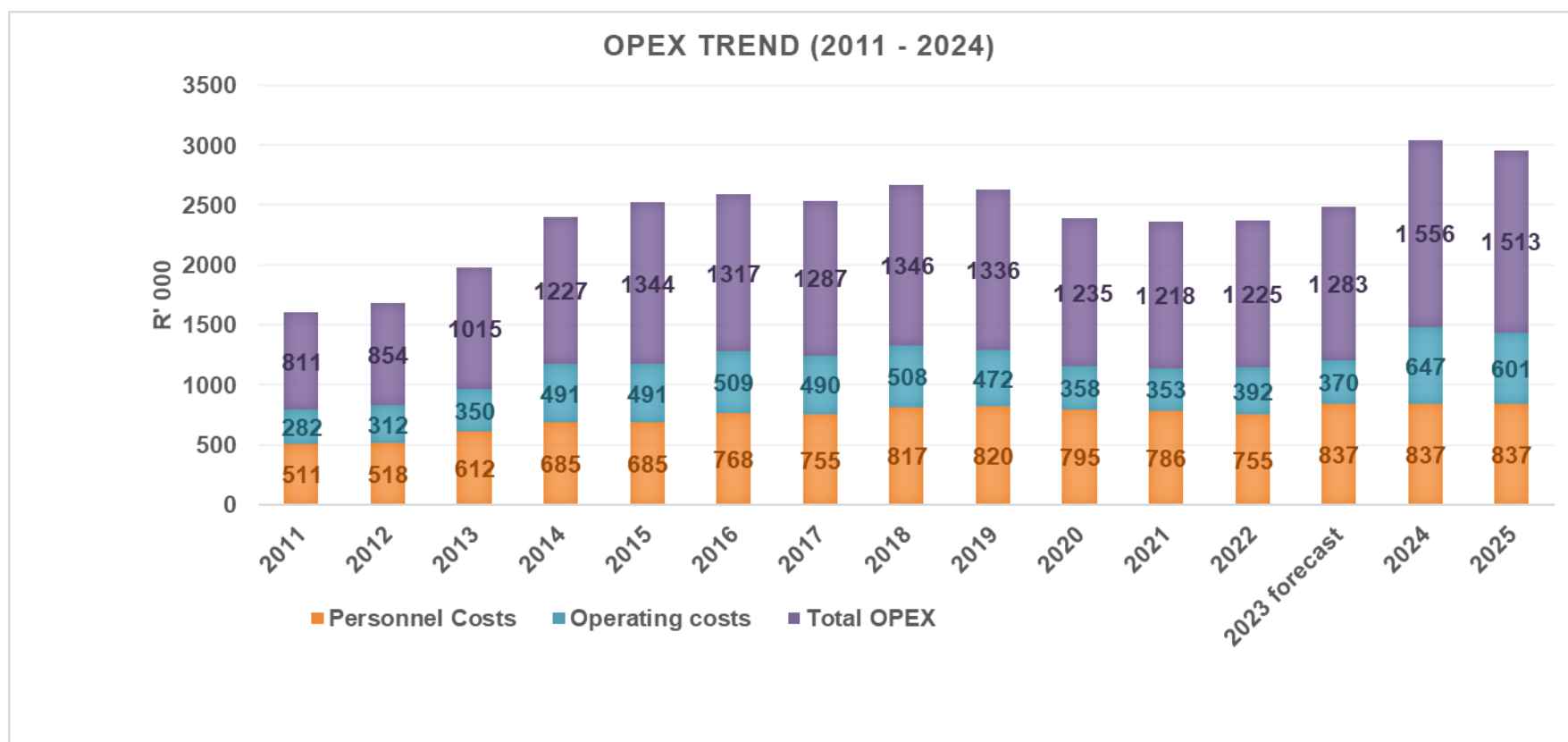
The funding sources, historical and budgeted are outline below, wherein the parliamentary continues to be a significant and dominating revenue source:



AGRICULTURAL RESEARCH COUNCIL BUDGET OVERVIEW FOR THE MTEF PERIOD CONSOLIDATED INCOME AND EXPENDITURE ESTIMATE				
		2023/24	2024/25	2025/26
		R'000	R'000	R'000
BASELINE FUNDING	Baseline Allocation - Operational	843 684	881 650	921 324
	Baseline Allocation - Capital	110 027	114 978	120 152
	Baseline Allocation - FMD Vaccine Facility Ring-fenced	87 504	91 442	95 557
	Ncera	6 741	7 044	7 361
	Total Baseline Funding	1 047 955	1 095 113	1 144 393
PROVISION OF NATIONAL SERVICES	Climate Monitoring	2 334	2 439	2 549
	SADC Activities (Ring-fenced)	5 010	5 236	5 471
	Intergis	3 332	3 482	3 638
	Crop Forecasting	15 432	16 127	16 853
	Diagnostic Services	27 532	28 771	30 066
	Total Other Grants	53 641	56 055	58 577
MAINTENANCE OF NATIONAL ASSETS	Gene banks; National Collections; Inventories; Databanks; Surveys and Information Systems - DSI	26 087	-	-
	National Public Goods Assets- DALRRD	22 044	23 036	24 072
	Total Funding for National Assets	48 131	23 036	24 072
TOTAL GRANTS	PG Excluding VAT	1 149 727	1 174 204	1 227 043
	VAT	172 459	176 131	184 056
	PG Including VAT	1 322 186	1 350 334	1 411 099
BASELINE FUNDING ARC	Total Grants (excl. VAT)	1 149 727	1 174 204	1 227 043
	External Income (excl. VAT)	456 962	477 525	499 014
	Other Income (excl. VAT)	65 109	68 039	71 101
	Total Revenue	1 671 798	1 719 768	1 797 158

PROJECTED EXPENDITURE FOR 2023/24 MTEF PERIOD

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 (79.8%).



AGRICULTURAL RESEARCH COUNCIL BUDGET OVERVIEW FOR THE MTEF PERIOD CONSOLIDATED INCOME AND EXPENDITURE ESTIMATE				
		Medium - Term Expenditure		
		2023/24	2024/25	2025/26
		R'000	R'000	R'000
Economic Classification	Compensation of employees	836 842	836 842	836 842
	Goods and Services	646 645	600 657	627 686
	Use of Infrastructure (Depreciation)	72 420	75 679	79 084
	<u>Payment of Capital Assets</u>			
	Acquisition	110 027	114 978	120 152
	FMD - Project related	169 131	178 696	186 738
	TOTAL	1 835 064	1 806 851	1 850 502
Standard Items of Expenditure	Current			
	Compensation of Employees - Core Research	711 316	711 316	711 316
	Compensation of Employees - Administrative Support	125 526	125 526	125 526
	Goods and Services	646 645	600 657	627 686
	Use of Infrastructure (Depreciation)	72 420	75 679	79 084
	Capital Assets	279 157	293 674	306 889
	TOTAL	1 835 064	1 806 851	1 850 502

CONSOLIDATED RESOURCES ALLOCATION

R'000	Audited Outcomes			Estimated Expenditure	MTEF Expenditure Estimates		
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Economic classification							
Compensation of employees	795	786	755	837	837	837	837
Goods and Services	440	432	470	446	719	676	707
Total expenses:	1 235	1 218	1 225	1 283	1 556	1 513	1 544
Staff complement (no.)	2 542	2 583	2 569	2 575	2 588	2 596	2 604

CONSOLIDATED FINANCIAL STATEMENTS OVERVIEW

AGRICULTURAL RESEARCH COUNCIL - THREE YEAR REVIEW					
Statement of Financial Performance					
	Audited	Forecast	Budget	Budget	Budget
	2022	2023	2024	2025	2026
	R'm	R'm	R'm	R'm	R'm
Total Income	1 394	1 392	1 672	1 628	1 702
Parliamentary Grant	1 029	1 060	1 150	1 083	1 131
Baseline - Operational	923	950	1040	968	1011
Baseline - Capital	106	110	110	115	120
External Income	317	249	457	478	499
Other Income	48	83	65	68	71
Total expenditure	1 225	1 283	1 556	1 513	1 544
Personnel Costs	755	837	837	837	837
Operating Expenditure	392	370	647	601	628
Depreciation	78	76	72	76	79
Interest Paid	0	0	0	0	0
Net Surplus/(Deficit)	168	110	116	115	158
Capital Expenditure	(106)	(110)	(110)	(115)	(120)
Net Operational Surplus/(Deficit)	62	(0)	6	0	38

Statement of Financial Position					
	Audited 2021/22	Forecast 2022/23	Budgeted 2023/24	2024/25	2025/26
	R'000	R'000	R'000	R'000	R'000
ASSETS					
Current Assets	949 313	999 642	997 963	948 978	941 814
Cash and cash equivalents	796 969	933 985	884 901	846 641	843 701
Receivables	133 678	52 681	102 681	92 995	89 705
Inventories	18 666	12 975	10 380	9 342	8 408
Non-current Assets	1 999 748	1 991 392	2 205 908	2 256 246	2 269 389
Investment property	4 991	5 000	5 000	5 000	5 000
Property, plant and equipment	1 982 588	1 965 026	2 178 590	2 221 549	2 232 385
Intangible assets	11 946	21 143	22 095	29 474	31 781
Heritage assets	223	223	223	223	223
Total Assets	2 949 061	2 991 035	3 203 870	3 205 224	3 211 203
LIABILITIES					
Current Liabilities	236 890	372 148	333 020	452 174	510 002
Payables	236 890	372 148	333 020	452 174	510 002
Provisions	-	-	-	-	-
Non-current Liabilities	496 339	511 833	575 687	402 030	285 905
Employee benefits	11 534	18 003	18 813	19 660	20 544
Deferred Income: Revenue Grants	484 806	493 830	556 874	382 371	265 361
Total Liabilities	733 229	883 981	908 706	854 204	795 907
Net Assets	2 215 832	2 107 054	2 295 164	2 351 020	2 415 296
Capital Fund	111 986	111 986	111 986	111 986	111 986
Reserves	1 015 846	1 017 578	1 089 807	1 091 471	1 141 471
Accumulated Surplus/(Loss)	1 088 000	977 490	1 093 371	1 147 563	1 161 839
Total Net Assets	2 215 832	2 107 054	2 295 164	2 351 020	2 415 296

	Cash Flow Statement				
	Audited 2021/22	Forecast 2022/23	Budgeted 2023/24	2024/25	2025/26
	R'000	R'000	R'000	R'000	R'000
Receipts	1 492 327	1 513 270	1 485 023	1 517 742	1 581 930
Sales of goods and services	320 676	397 993	319 874	334 268	349 310
Grants	1 140 648	1 060 279	1 149 727	1 174 204	1 227 043
Interest received	30 990	54 930	15 354	9 212	5 527
Dividend received	14	69	69	58	49
Payments	(1 146 996)	(1 288 320)	(1 245 012)	(1 263 379)	(1 282 573)
Employee Costs	(754 698)	(897 732)	(836 842)	(836 842)	(836 842)
Suppliers	(392 050)	(390 584)	(408 160)	(426 527)	(445 721)
Interest Paid	(248)	(5)	(10)	(10)	(11)
Net Cash flows from operating activities	345 331	224 950	240 011	254 363	299 356
Purchases of property, plant and equipment	(50 525)	(87 935)	(289 095)	(292 623)	(302 296)
Proceeds from sale of properties and equipment	0	0	0	0	0
Net Cash flows from investing activities	(50 525)	(87 935)	(289 095)	(292 623)	(302 296)
Net increase(decrease) in cash and cash equivalents	294 807	137 016	(49 084)	(38 260)	(2 939)
Cash and cash equivalents at the beginning of the period	502 163	796 969	933 985	884 901	846 641
Cash and cash equivalents at the end of the period	796 969	933 985	884 901	846 641	843 701

Human Resources

DIVISION	ADMINISTRATION & SUPPORT
Human Resources	40
Finance	107
ICT and Infrastructure	38
Impact & Partnerships	25

7. MATERIALITY FRAMEWORK

For the purposes of materiality defined in sections 50(1), 54(2), 55(2) and 66(1) of the Public Finance Management Act²⁸, 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 II 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	Any identified loss through criminal, reckless or negligent conduct.

²⁸ Available: <http://www.treasury.gov.za/legislation/PFMA/act.pdf>

PFMA SECTION	QUANTITATIVE (AMOUNT)	QUANTITATIVE (NATURE)
	preparation of the Annual Financial Statements. 3. Any irregular, fruitless and wasteful expenditure, defined by the PFMA, will be reported.	
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 66 (1) Restrictions on borrowing, guarantees and other commitments.	Any amount	This public entity may not borrow money, nor issue a guarantee, indemnity or security, nor enter into any other transaction that binds or may bind the institution to any future financial commitment unless acting through the relevant executive authority. (PFMA section 66 (3)(c).
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:	Not applicable	-
(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	The significance level for the ARC is based on the FY2023/24 budget is set at: Acquisition: More than R64 million Disposal: Movable Assets the combined value of which exceeds R64 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 a 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.		

PFMA SECTION	QUANTITATIVE (AMOUNT)	QUANTITATIVE (NATURE)
<p>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 –</p> <p>a) Is authorised by this Act, and</p> <p>b) In the case of public entities, is also authorised by other legislation no in conflict with this Act.</p>	<p>All borrowings contemplated by the Agricultural Research Council, has to be pre - authorised by the National Treasury regardless of the amount.</p>	<p>All borrowings contemplated by the Agricultural Research Council, has to be pre-authorized by the National Treasury regardless of the nature</p>

The Significance and Materiality calculation is based on the FY2023/24 budgeted figures and on the following parameters:

BASIS	ACCEPTABLE % RANGE	MINIMUM	MAXIMUM
Total Revenue	0.5% - 1%	8 358 990	16 717 980
Profit after tax	2% - 5%	2 220 000	5 550 000
Total Assets	1% - 2%	32 038 700	64 077 400

8. UPDATED KEY RISKS

The table below reflects the key risks identified by the ARC as at January 2020, and aligned to the Strategic Plan for 2020-2025, including risk mitigation measures.

OUTCOME	KEY RISK	RISK MITIGATION
1. Increased agricultural production and productivity	• Natural disaster (e.g. drought)	• Drought mitigation strategies
	• Government continued funding	• Continue lobbying shareholder
	• Lack of interest by farmers to join Improvement Schemes	• Effective marketing of Improvement Schemes
	• Lack of regulations on testing of agricultural equipment's e.g. tractor	• Continue lobbying, • Enforcement of regulations
	• Intentional drive from the industry to make ARC crop science irrelevant to the sector	• MoU's and agreements • Improved marketing of ARC capabilities, solutions and research results. • Joint projects • Sharing of strategic direction
2. Sustainable ecosystems and natural resources	• Competition for agricultural land	• Supply data and information to decision support systems
	• Insufficient regulations to conserve/ protect valuable ecosystems	• Optimal enforcement of regulations
	• Lack of infrastructure e.g. Natural Resource Information System	• Continue lobbying • Additional funding
3. Improved nutritional value, quality and safety of agricultural products	• Shortage critical and scarce skills	• Succession planning • In-house training • Headhunting
	• Accreditation of laboratories	• Obtain accreditation
	• Lack of focussed funding	• Liaise with key stakeholders/partners • Sourcing of external funding
4. A skilled and capable agriculture sector	• Lack of funding	• Strategic partnerships • Continue lobbying departments
	• Shortage of mentors	• In-house training of mentors / collaboration with universities
	• Availability of suitable research facilities	• Rehabilitate the research facilities
	• Lag time for patents in animal research	• Apply advance biotechnology
	• Policy / legislation restriction -	• Continue lobbying
	• Lack of competitive advantage in offering engineering and specialised solutions to the sector	• Talent management strategy • MoU's with relevant partner institutions
5. Enhanced resilience of agriculture	• Lack of registration for GMP compliant vaccine	• Continue lobbying with relevant authorities • Construction of new vaccine factory
	• New generation vaccines on the market, reduce sales and production	• Production of new generation vaccines
	• Availability of reagents	• Availability of funds to procure reagents
	• Skilled and competent staff	• Staff training (Formal and Informal)
	• Disruption in power supply	• Procurement and maintenance of standby generators
	• Lack of government support for maintaining agricultural weather services	• Obtain funding • Continuous lobbying
6. A high performing and sustainable organisation	• Lack of structured succession planning process	• Succession planning policy • Succession plans from each campus • Skills transfer interventions (formal and informal) • Draft mentoring and coaching policy
	• Loss of highly skilled personnel (scarce and critical skills)	• Retention policy • Remuneration policy • Formal and informal training • Competency framework
	• Inability to perform optimally within the ARC procurement process	• Finance and supply chain management policies to be improved • Procurement procedures to be reviewed • Fraud and Prevention Plan/ Policy
	• Non-recognition of income across ARC Campuses	• Finance policies • Income contract register • Debtor age analysis per campus
	• Paralysis within core business as a result of constrained (inefficient/ inflexible/ dysfunctional/ ineffective) business support processes	• Improve policies and procedures guiding business processes

Aligned to the strategic outcomes of the ARC, the following annual 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 2023/24 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	Challenges with respect to: <ul style="list-style-type: none"> * the recruitment and retention of suitably qualified and experienced personnel in critical and scarce skill areas * succession planning *the loss of high level qualified and experienced personnel *inability to replace essential support staff
2	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
3	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
4	Funding constraints to fully meet the ARC 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. co-ordinated revenue generated approach) or *funding from commodity organisations at risk (i.e. withdrawn / not continuing)
5	Delayed implementation of the approved ARC Commercialisation Strategy
6	Inability to deliver FMD vaccines in 2023/24 FY due to delays in the construction of the FMD Vaccine Facility
7	Negative impact on ARC operational environment due to continued load shedding
8	Non-compliance to key legislation: <ul style="list-style-type: none"> *insufficient centralised process to co-ordinate legislative compliance, across the organisation. * environmental compliance as per assessment
9	Sub-optimal leveraging of ARC assets, property and facilities, as outlined in the Asset Management Plan
10	Negative Climate change: impact on infrastructure (higher risk for damage caused by floods and storms/lighting) and agricultural R&D (climate extremes, heat waves, water shortage, floods)

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 Veterinary Research 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). FMD is listed as a controlled disease in South Africa in terms of the Animal Disease Act 35 of 1984²⁹. 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 because 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 R400 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:

- a. 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
- b. 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 manufacturing practice (GMP) which is

²⁹ Available: <https://www.gov.za/documents/animal-diseases-act-12-mar-2015-1128#>

required not only for export purposes but also by the South African Medicines Control Council to grant the manufacturing license for the factory.

- c. 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.
- d. 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 (24 months – 2021/2022)	<p>Below are the appointed service providers for the development of the new FMD vaccine factory at OVR:</p> <ul style="list-style-type: none"> • Process engineering firm • Architectural firm • Mechanical Engineering firm • Electrical Engineering firm • Civil & Engineering firm • Quantity Surveying firm <p>The above appointed service providers have commenced with the stage 1 of 6 of the construction, which entails the design and planning, infrastructure and bulk services studies and project budget</p>
Construction (32 months)	<p>Ordering of specialised equipment for vaccine production</p> <p>Construction of building according to specifications</p> <p>Issue of compliance certificates of completion in relation to National Building Standards</p>
Validation (18 months)	<p>Foot and mouth disease vaccine trials</p> <p>Inspection</p>
Full commercial Production	<p>The first commercially available vaccines will only be available in 4.5 to 5 years from the start of the process.</p>

As this is a specialised building, highly skilled external consulting engineers and other specialists have been appointed to develop a concept layout and detailed design of the manufacturing process. The coordination between the different appointed service providers are underway to ensure that the building meets the minimum standards 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).

ICT-RELATED PROJECTS

ENTERPRISE RESOURCE PLANNING (ERP) SOLUTION

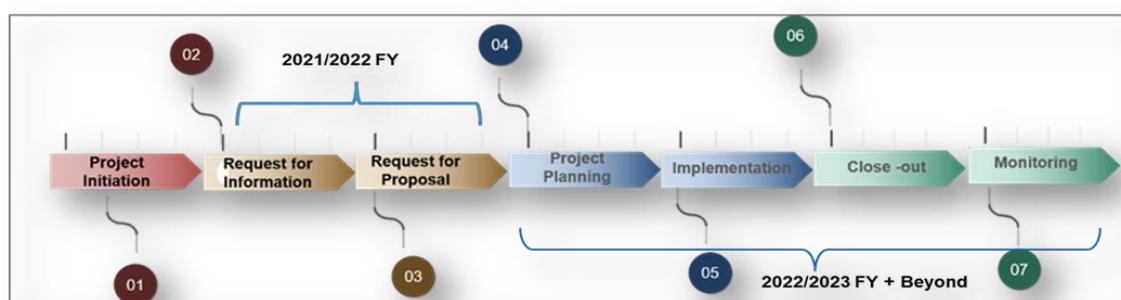
The ARC implemented Microsoft Dynamics R2 (DAX R2), which was upgraded in 2019 to DAX R3. However, it was discovered DAX R2 did not sufficiently meet ARC's Human Resource and Payroll requirements. The DAX R2 system adequately addressed the Project Management, Finance and Supply Chain Management (SCM) requirements. It was therefore resolved in 2019 to upgrade Sage payroll system used at the time to Sage People which included Human resource and Payroll modules. In addition, the asset and property management modules were introduced in 2019 to address the gaps identified in the DAX R3. Although the above ERP systems assists ARC in conducting its business, the following issues have been highlighted with current ERP arrangement:

- High licensing and maintenance costs due to multiple systems.
- Organisational information is dispersed over various systems and thus making consolidation and integration of organisational information cumbersome.
- The Sage People solution for HR and Payroll has been welcomed by the business for performing day to day activities. However, the Finance division seems to be dissatisfied with

the standard DAX R3 solution due to certain limitations (i.e., bank statement reconciliations, vendor rotation functionality, BEE information and ratings, stock and warehouse management and overall reporting).

- The DAX R3 system will reach end of mainstream support by 10 December 2021 and extended support by 1 October 2023.
- The DAX R3 system is not performing as it should be due to the limitations on the current ICT infrastructure
- There is also a need to automate additional business processes not covered in the current ARC ERP offering.

A new ERP solution - Sage X3 was therefore procured to mitigate the above issues and improve operations in ARC. The figure below depicts the Project road map:



The ERP project is currently underway, commenced from September 2022 and expected to be completed end of September 2023. Below are the Project Milestones:

Task Name	Duration	Start	Finish	Work	% Complete
Sage X3 Implementation Services				0 hrs	0%
• Milestone 1 - Contract Signing	7 days	Mon 19/09/22	Tue 27/09/22	16 hrs	0%
• Milestone 2- Analysis	56 days	Mon 03/10/22	Mon 19/12/22	383 hrs	0%
• Milestone 3 - Design & Build	55 days	Mon 19/12/22	Fri 03/03/23	943 hrs	0%
• Milestone 4 - Testing and Training	82 days	Fri 17/02/23	Mon 12/06/23	1 045 hrs	0%
• Milestone 5 - Deployment	16 days	Wed 10/05/23	Wed 31/05/23	543 hrs	0%
• Milestone 6 - Integrations	79 days	Mon 29/05/23	Thu 14/09/23	1 134 hrs	0%
• Milestone 7 - Live run	7 days	Tue 12/09/23	Wed 20/09/23	132 hrs	0%
• Milestone 8 - Project Closure	11 days	Wed 13/09/23	Wed 27/09/23	164 hrs	0%
• Phase - ARC Additional Specific Requirements				1 556 hrs	0%

The cost of the project is R38 196 639 million, below is the project billing schedule:

Description (Estimated)	Services	Year 1 (ZAR)	Year 2 (ZAR)	Year 3 (ZAR)	TOTAL (ZAR)
Sage X3 License Subscription		3,291,558	6,542,743	7,000,735	16,835,035
Project Initiation Fee Milestone 1 - 20%		1,171,120			1,171,120
Professional Services Milestone 2 - 20%		1,171,120			1,171,120
Professional Services Milestone 3 - 15%		878,340			878,340
Professional Services Milestone 4 - 15%		878,340			878,340
Professional Services Milestone 5 - 10%		585,560			585,560
Professional Services Milestone 6 - 10%		585,560			585,560
Professional Services Milestone 7 - 5%		292,780			292,780
Professional Services Milestone 8 - 5%		292,780			292,780
ARC Additional Specific Requirements		666,600	666,600	666,600	1,999,800
Microsoft Azure Hosting Services		579,174	619,716	663,097	1,861,987
Professional Services Support & Maintenance Sage X3		-	1,301,400	1,392,498	2,693,898
Professional Services Support & Maintenance HR		894,240	894,240	894,240	2,682,720
Travel (as required)		428,476	428,476	428,476	1,285,428
Total Project Investment (ZAR) Excluding VAT		11,715,648	10,453,175	11,045,646	33,214,469
VAT @ 15%		1,757,347	1,567,976	1,656,847	4,982,170
Total Project Investment (ZAR) Including VAT		13,472,995	12,021,151	12,702,492	38,196,639

SOLAR POWER PROJECT

South Africa is one of the best places to develop solar power. The sun is, without a doubt, one of the most reliable and abundant natural resources in South Africa. Most areas in South Africa average more than 2 500 hours of sunshine per year, with an average solar-radiation level range of between 4.5 and 6.5kWh/m² per day. Currently, Eskom generates less power compared to what the country needs. This results in the national grid being constrained, thus resulting in load shedding as the baseload and peak load power stations do not produce ample electricity. Furthermore, some baseload stations need to be removed from service to undergo scheduled maintenance.

Requirement for maintenance on SA power grip will increase as the network expands to accommodate more developments but increase the demand and risk of power load-shedding.

Currently, the renewable energy industry focusing on solar generation has grown dramatically, and private & public customers are being persuaded to invest in renewable energy. The renewable energy market has grown and shown the potential for companies to invest in a financially viable & reliable renewable energy Grid-Tied generation plant.

In the ARC, electricity, water, and municipal-related fees continue to be the highest operating costs of buildings. The Facilities Section and the AE Campus are working on a project to evaluate each Campus's electricity consumption and provide alternative energy solutions, such as a solar system across the organisation. In addition, each Campus continues to look at various options for reducing

electricity costs. For instance, the installation of occupancy sensors is one such project that has been piloted at CO with success. Occupancy sensors detect when a space is empty and, as a result, turn off or dim the lights to save energy. But the most significant impact will be the implementation of Solar Solutions systems to off the grid power into the Institute's power consumption.

Benefits of Implementing Solar Projects in the ARC

- Reduction of operating costs in so far as the electricity bill is concerned.
- Protects sensitive equipment and Infrastructure that must be kept running at all times.
- Solar power projected costs are 80c/kWh compared to Eskom's power of R1.92/kWh.
- A phased approach could be implemented to start reducing costs and getting a return on investment already in the beginning, to fund the future expansion until not reliant on any external power supply.
- The savings could also be used to absorb the annual increase in electricity and property rates, which usually range between 16-20%.
- The grid power is also highly volatile, and load shedding results in power surges which have caused electrical damage to transformers and other electrical equipment with significant cost implications.

Current Solar implementation in the ARC

To date, only the Infruitec and TSC campuses have invested in Solar at a total value of R3.3 million (Infruitec, at a value of R2 million, and TSC, at a value of R1.34 million). The benefits realised to date include:

- Reduction of electricity bills in relation to power needs.
- Stable power grip.
- Impact of load shedding reduced.
- Equipment maintenance costs were reduced due to power issues.

These two (2) campuses comprise of power-supported laboratory equipment requiring an uninterrupted and consistent power supply for running experiments and research operations. The power supply from the power utility has become erratic and characterised by power cuts and load shedding. This situation negatively impacts the proper functioning of the campuses and the resulting research output.

In addition, these two (2) campuses have the highest electricity bill, which is approximately R12.5 million annually. Since the implementation of these Solar Solutions, there have been notable savings/reductions in electricity consumption. To date, both campuses have realised a combined estimated savings of 23% on electricity costs but limited on the overall account due to the small solar installations and impact on the bigger power grip of the sites.

Capex investment in Solar in the ARC

To address the ARC's Solar requirements and reduce the ARC's Carbon footprint, Infrastructure has requested R81 million Capex investment over the next seven (7) years (starting in 2022-2023), with an allocated R11,5 million per year to roll out Solar to all sites in the ARC. Prioritisation will be aligned to higher electrical consumption of the sites and the Carbon footprint report, starting with the highest and most costly power usage site. Per the current prioritisation of the Capex investment, year one will start with ARC-Infruitec and ARC-TSC going down to ARC-GC in the last year. ARC-IC, ARC-SCW, and ARC-AE were excluded from this process due to the plan to move them to the ARC-Roodeplaat Campus.

ARC INSTITUTE	ESTIMATE SOLAR INVESTMENT COST	
Infruitec	R	3,000,000.00
TSC	R	3,450,000.00
OVR	R	21,000,000.00
AP	R	21,000,000.00
SG	R	6,000,000.00
GC	R	6,000,000.00
CO	R	3,000,000.00
VIMP	R	13,000,000.00
PHP	R	5,000,000.00
TOTAL	R	81,450,000.00

Cost implications for ARC-VIMP might increase when other campuses are moved but will be factored into future projections. The Project implementation will be spread over seven (7) years as the project can be implemented in stages with benefits realisation as and when portions of the installation go live.

Current Solar Project Status

For FY22/23, the following solar projects are in progress.

SOLAR TYPE	CAPACITY	LOCATION	ESTIMATED COST
Roof-top PV Solar	75kw	Infruitec	R 3 000 000.00
Integrated LED lights & PV Solar	60kw	Infruitec	R 2 000 000.00
3 x PC Solar System	30kw	TSC - Pathology building	R 1 047 118.75
Roof-top PV Solar	75kw	TSC - Pathology building	R 2 600 000.00
Roof-top PV Solar	30kw	TSC - Biotech building (upgrade)	R 800 000.00
Roof-top PV Solar	60kw	TSC - Water purification plant	R 2 062 881.25
Total			R11 510 000.00

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 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	National wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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 stakeholders/clients ranging from farmers and or public on various products, services and process. The

ARC: Annual Performance Plan 2023/24

	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 crop agriculture as well as reports to other stakeholders and can include manuals and guides for crop production.
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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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 on crop/cultivar evaluations conducted by the ARC (can be ARC crop/cultivar or services outsourced to the ARC), 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 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	National wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences

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

	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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences

OUTCOME 2: SUSTAINABLE ECOSYSTEMS AND NATURAL RESOURCES

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 on natural resources 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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

ARC: Annual Performance Plan 2023/24

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	National wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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 ³⁰ (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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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 and/or manual of results indicating the number samples (soil, plant material and water) analysed
Method of Calculation / Assessment	Counting of number of reports and/or manuals of results indicating the number of samples analysed. Each reports contains a batch with number of samples (soil, plant material, or water) per separate report.
Means of verification	Client report and/or manuals containing results of samples (soil, plant material, and water) analysed
Assumptions	The ability of participants to request/demand services from the ARC

ARC: Annual Performance Plan 2023/24

Disaggregation of Beneficiaries	Not applicable
Spatial Transformation	Not applicable
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences Group Executive: Animal Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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, crop production 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences Group Executive: Animal Sciences

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
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- End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

Output	Weed Science
Output Indicator 2.3.1	Number of technical reports produced
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 crop production 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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. This official reports contains results of services issued by the ARC to farmers participating crop production 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

ARC: Annual Performance Plan 2023/24

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	Nation wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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 crop production/ 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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
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), 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences

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
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

ARC: Annual Performance Plan 2023/24

Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

OUTCOME 4: SKILLED AND CAPABLE AGRICULTURE SECTOR

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, online 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, online 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	National wide International Global (Depending on the request from the training) SADC Southern Africa (Depending on the request from the training)
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: Impact & Partnerships

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	National wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Impact & Partnerships Group Executive: Animal Sciences Group Executive: Crop Sciences

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
Spatial Transformation	Not applicable

ARC: Annual Performance Plan 2023/24

Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences Group Executive: Impact & Partnerships

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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, Addendums signed
Assumptions	Availability of funding
Disaggregation of Beneficiaries	Not applicable
Spatial Transformation	Not applicable
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Impact and Partnerships

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, online registers/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	National wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences

Output	Smallholder farmer supported
Output Indicator 4.3.2	Number of technical assessments for commercial readiness
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	Nation wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences

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	Nation wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences Group Executive: Impact and Partnerships

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	Nation wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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	Nation wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: Impact and Partnerships

Output	Farmer support
Output Indicator 4.4.4	Number of services rendered
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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences

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	Journals - A copy of the front/title page of articles in refereed journals Chapters in books – A copy of the cover/title page and table of contents of the book Conference proceedings – front/title page of conference proceedings Theses – Front/title page of theses. 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: Impact and Partnerships

Output	Knowledge generated and dissemination
Output Indicator 4.5.2	Number of popular publications
Definition	Number of popular publications developed and published, 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 and published(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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: Impact and Partnerships

Output	Knowledge generated and dissemination
Output Indicator 4.5.3	Number of public awareness events
Definition	This refers to public awareness events/activities where 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, a copy of the event programme
Assumptions	Availability of funding
Disaggregation of Beneficiaries	Not applicable
Spatial Transformation	Not applicable
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences Group Executive: Impact and Partnerships

OUTCOME 5: ENHANCED RESILIENCE OF AGRICULTURE

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly

Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences

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 and crop production 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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences

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

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	National wide
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Science

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting targets set for the 2023/24 FY
Indicator Responsibility	Group Executive: Animal Science

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meet target sets for 2023/2024 FY
Indicator Responsibility	Group Executive: Animal Sciences

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

Spatial Transformation	Not applicable
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting target set for 2023/24 FY
Indicator Responsibility	Group Executive: Animal Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting target set for 2023/24 FY
Indicator Responsibility	Group Executive: Crop Sciences

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-End)
Reporting Cycle	Quarterly
Desired Performance	Meeting target set for 2023/24 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 2023/24 FY
Indicator Responsibility	Group Executive: Information Systems

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 2023/24 FY
Indicator Responsibility	Group Executive: Information Systems

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 2023/24 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	Stabilisation 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 2023/24 FY
Indicator Responsibility	Group Executive: Information Systems

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

Calculation Type	Non-Cumulative
Reporting Cycle	Annual
Desired Performance	Meeting target set for 2023/24 FY
Indicator Responsibility	Group Executive: Information Systems

Output	Human Resources Management
Output Indicator 6.3.1.1	Report on the vacancy rate produced
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 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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	Report detailing the 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	Meeting target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

Output	Human Resources Management
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	Meeting target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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

ARC: Annual Performance Plan 2023/24

Source of data	Report on 360 leadership dimensions
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	Meeting target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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	Meeting target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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	Meeting target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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 target set for 2023/24 FY

Indicator Responsibility	Senior Manager: Human Capital Management
---------------------------------	--

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 target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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 target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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 target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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

ARC: Annual Performance Plan 2023/24

Reporting Cycle	Annual
Desired Performance	Meeting target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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 target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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 target set for 2023/24 FY
Indicator Responsibility	Senior Manager: Human Capital Management

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	Meeting target set for 2023/24 FY
Indicator Responsibility	Group Executive: Impact and Partnerships

Output	Exhibitions and sponsorships
Output Indicator 6.4.2	Number of exhibitions and sponsorships
Definition	Refers to number of ARC and sectoral events /or programmes /or projects participated in by means of exhibitions /or sponsorships. Exhibitions refer to mechanisms used to showcase the work of the ARC internally and externally on various platforms. Sponsorships refers to events/or programmes/or projects that are aligned to the mandate of the ARC sponsored by means of donating human resources/or financial resources by the ARC.
Source of data	Reporting and budget spent
Method of Calculation / Assessment	Counting of events/or programmes/or projects

ARC: Annual Performance Plan 2023/24

Means of verification	Reporting and budget spent
Assumptions	Availability of funding
Disaggregation of Beneficiaries	Not applicable
Spatial Transformation	Not applicable
Calculation Type	Cumulative (Year-End)
Reporting Cycle	Quarterly
Desired Performance	Increase visibility/ awareness of the work of the ARC
Indicator Responsibility	Group Executive: Impact and Partnerships

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	Meeting target set for 2023/24 FY
Indicator Responsibility	Group Executive: Impact and Partnerships

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.) Audit opinion report by External Auditors
Means of verification	Annual Financial Statements and supporting documentation submitted to the auditors, report on the ARC audit opinion by External 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	Meeting target set for 2023/24 FY
Indicator Responsibility	Chief Financial Officer

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 target set for 2023/24 FY
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
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 target set for 2023/24 FY
Indicator Responsibility	Chief Financial Officer

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	Meeting target set for 2023/24 FY
Indicator Responsibility	Chief Financial Officer

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	Non-Cumulative
Reporting Cycle	Annual
Desired Performance	Meeting target set for 2023/24 FY
Indicator Responsibility	Chief Financial Officer GE: Impact and Partnerships

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	Meeting target set for 2023/24 FY
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	Meeting target set for 2023/24 FY
Indicator Responsibility	Chief Financial Officer

ANNEXURES TO THE ANNUAL PERFORMANCE PLAN

ANNEXURE A: AMENDMENTS TO THE STRATEGIC PLAN

Not applicable for 2023/24, as the third 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

OUTPUT	INDICATOR	SPATIAL TRANSFORMATION	
OUTCOME 1: INCREASED AGRICULTURAL PRODUCTION AND PRODUCTIVITY			
Crop technologies developed and information dissemination	Number of field trials	Western Cape	West Coast District, Bergrivier Local Municipality, Overberg District, Cape Agulhas Local Municipality, Cape Winelands District, Drakenstein Local Municipality, West Coast District, Swartland Local Municipality, Overberg District, Swellendam Local Municipality, Overberg District, Theewaterskloof Local Municipality, West Coast District, West Coast District Municipality, West Coast District, Swartland Municipality, West Coast District, Saldanha Bay Municipality, Garden Route District, Garden Route District Municipality
		Northern Cape	Upington, Keimoes, Kakamas, Blouputs, Augrabies, Groblershoop, Francis Baard, Pixley ka Seme District, Siyancuma Local Municipality, Frances Baard District, Phokwane Local Municipality, Pixley ka Seme District, Renosterberg Local Municipality, Frances Baard District, Dikgatlong Local Municipality, Pixley ka Seme District, Thembelihle Local Municipality
		Limpopo	Mookghopong, Modimole Sekhukhune, Waterberg, Elias Motsoaledi Local Municipality, Gert Sibande District, Gert Sibande District Municipality
		North-West	Brits, JB Marks, Ngaka Modiri Molema District, Ramotshere Moiloa Local Municipality
		Free State	Thabo Mofutsanyana District, Dihlabeng Local Municipality, Lejweleputswa District, Masilonyana Local Municipality, Lejweleputswa District, Matjhabeng Local Municipality, Lejweleputswa District, Tswelopele Local Municipality
		KwaZulu-Natal	uMgungundlovu, Umkhanyakude, uThukela District, Okhahlamba Local Municipality
		Mpumalanga	Nkangala, Ehlanzeni District, Thaba Chweu Local Municipality, Sekhukhune District, Sekhukhune District Municipality
		Gauteng	City of Tshwane
Animal Improvement services	Number of farmers participating in each of the animal improvement schemes	Nationally	All Districts (Depending on the request from the farmer)
OUTCOME 2: SUSTAINABLE ECOSYSTEMS AND NATURAL RESOURCES			
Natural Resource Management	Number of field trials	Western Cape	Stellenbosch, Porterville, Paarl, Franschhoek, Robertson, Grabouw
		North West	JB Marks
		Gauteng	City of Tshwane
OUTCOME 3: IMPROVED NUTRITIONAL VALUE, QUALITY AND SAFETY OF AGRICULTURAL PRODUCTS			
Broadening the food base	Number of field trials	Nationally	Depend on trial requirements

OUTPUT	INDICATOR	SPATIAL TRANSFORMATION	
OUTCOME 4: A SKILLED AND CAPABLE AGRICULTURE SECTOR			
Skills development Smallholder farmer supported	Number of people trained	International	Global (Depending on the request)
		SADC	Southern Africa (Depending on the request)
		Western Cape	All Districts (Depending on the request)
		Gauteng	
		North-West	
		Free State	
		Eastern Cape	
		KwaZulu-Natal	
		Mpumalanga	
		Limpopo	
		Northern Cape	
	Number of Postgraduate students supported by ARC	Western Cape	University of Cape Town University of Western Cape Stellenbosch University Cape Peninsula University of Technology
		Free State	University of the Free State
		Gauteng	University of South Africa University of Johannesburg University of the Witwatersrand University of Pretoria Tshwane University of Technology Vaal university of Technology
		Limpopo	University of Limpopo University of Venda
		KwaZulu-Natal	University of Kwazulu-Natal University of Zululand Mangosuthu University of Technology
		North West	North West University
		Number of farmers trained	Western Cape
	Northern Cape		Eksteenskuil
	Limpopo		Gyani, Polokwane, Tzaneen Capricorn District, Mopani District, Sekhukhune District Vhembe District, Waterberg District
	Mpumalanga		Nkomazi, Gert Sibande
	KwaZulu-Natal		Mtubatuba, Ehlanzeni District, Gert Sibande District Nkangala District
	North-West		Bojanala Platinum District, Dr Kenneth Kaunda District, Dr Ruth Segomotsi Mompoti District, Ngaka Modiri Molema District
	Gauteng		Sedibeng District, Tshwane Metropolitan, City of Johannesburg, City of Ekurhuleni

OUTPUT	INDICATOR	SPATIAL TRANSFORMATION	
	Number of technical assessments for commercial readiness	Gauteng	Sedibeng West Rand
		KwaZulu-Natal	uMkhanyakude District uMzinyathi District
	Number of smallholder farmers participating in KyD	Western Cape	All Districts (Depending on the request from the farmer)
		Northern Cape	
		Limpopo	
		North-West	
		Free State	
		Eastern Cape	
		KwaZulu-Natal	Amajuba District, Harry Gwala District, iLembe District, King Cetshwayo District, uMkhanyakude District, uMzinyathi District, uThukela District, Zululand District
	Mpumalanga	Ehlanzeni District, Gert Sibande District Bohlabela District Nkangala District	
Gauteng	Ekurhuleni District, Tshwane District, City of Johannesburg District, Sedibeng District, West Rand District		
Number of farmer field days	North West	Ngaka Modiri Molema	
	Limpopo	Vhembe, Mopane	
	Mpumalanga	Gert Sibande, Ehlanzeni	
Farmer support	Number of farm assessments	Nationwide	Depending on request
	Number of farmers supported	Northern Cape	Eksteenskuil
		Gauteng	Rand West City Local Municipality
	Number of farmer field days	Free State	Thabo Mofutsanyana District
		North-West	Bojanala Platinum District, Dr Kenneth Kaunda
		KwaZulu-Natal	uMkhanyakude District, uMzinyathi District
Gauteng	Sedibeng District, West Rand District, Tshwane District, Ekurhuleni District		
OUTCOME 5: ENHANCED RESILIENCE OF AGRICULTURE			
Climate resilient solutions	Number of field trials	North West	Dr Kenneth Kaunda, Bojanala, Ngaka Modiri Molema, Dr Ruth Segomoesi Mompoti,
		Free State	Thabo Mofutsanyane, Lejweleputswa, Fezile Dabi, Motheo,
		KwaZulu-Natal	uMgungundlovu, Umkhanyakude, uThukela, Okhahlamba, Umvoti uMzinyathi,
		Limpopo	Waterberg, Sekhukhune, Mopani, Vhembe, Capricorn,
		Mpumalanga	Nkangala, Gert Sibande, Ehlanzeni, Amatole, Bushbuckridge,
		Eastern Cape	OR Tambo
		Gauteng	Ekurhuleni, City of Tshwane

Detailed information on Spatial Transformation will be included in the Quarterly Performance Reports during the 2023/24 FY.

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 2023/24 PLANNING

INTERNAL ENVIRONMENT – STRENGTHS			
No.	Strength	What about the strength must be leveraged for the remainder of 2022/23?	What about the strength must be leveraged in 2023/24?
1	Local and internationally recognised expertise.	<ul style="list-style-type: none"> Identify relevant expertise. Attract high level scientific skills Strengthen and improve our programmes in which we have an advantage. Identify the key thematic areas/competencies where we have an advantage/can become Centres of excellence Appoint Specialist Researchers who can serve as champions for those areas and develop a work plan and strategy for next few years. Align to the international relations strategy (e.g., BRICS forum for agriculture research). Foster local and international collaboration. Develop Centres of collaboration with universities and revive the previous Centres of excellence and expand to include international universities from all over the world. Collaborations. Encourage participation (posters and oral presentations) of core business (research personnel) at national and international scientific meetings and/or symposia. Ensure expertise remain in employment of ARC. Engage with existing clients on possible collaboration Identify gaps in expertise within the ARC Identify experts in the ARC who needs assistance with marketing of their work Increase participation on virtual conferences and webinars Incentivise participation of ARC experts in thought leadership initiatives Capitalise on linkages and networks established during the World Science Forum 2022 and in collaborative international projects 	<ul style="list-style-type: none"> Implement aligned strategy. Establish and maintain local and international collaboration agreements. Collaborative fundraising through partnerships. Participate in multinational, multi-stakeholder consortiums. Profile ARC experts. Change remuneration scales in the ARC to attract high level skills and retain expertise and scarce skills Implementing Promotion Strategy/Policy. Develop Centre of Excellence for FAO and WOAHA for high priority animal diseases More meaningful collaborations Encourage participation (posters and oral presentations) of core business at national and international scientific meetings and/or symposia. Strive to employ more expertise to build capacity Increase publications Encourage researchers to attend international conferences/symposia Encourage researchers to involved in local and international science committees Improved awareness and marketing of research capacity and footprint. Use expertise to attract large grants for scientific projects. Appointment of Specialist Researchers to be prioritise in critical research areas Improve general current awareness of outputs and achievements Increase participation on virtual conferences and webinars Profile ARC experts on the website to facilitate internal and external research collaboration Explore linkages in international collaboration
2	Capacity to train post-graduate students.	<ul style="list-style-type: none"> Engage with DSI, NRF and AgriSETA on ARC capability Resuscitate engagements with SAASTA for student training Engage with the Chinese embassy to understand their current surge in funding ARC employees and students. Engage other international embassies to develop key partnerships with range of Institutions 	<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 that can award degrees and post graduate qualifications or at least revive and develop new centres of collaboration as a first stepping stone towards this.... Explore option of ARC scientists serving as guest lecturers Higher Education Dept. Funding through / with Universities credit system (Skills development)

INTERNAL ENVIRONMENT – STRENGTHS			
No.	Strength	What about the strength must be leveraged for the remainder of 2022/23?	What about the strength must be leveraged in 2023/24?
		<ul style="list-style-type: none"> Higher Education Department. funding through / with Universities credit system (Skills development). Focus on scarce skills fields such as Agri metrology, Climate, etc. Maintain the partnership with the Agricultural Sector Education & Training Authority (AgriSETA) to give bursaries to agricultural science students through our flagship Professional Development Programme (PDP). Source students for 2023/24 with current funding. Identify critical succession needs – Identify candidates that are suitable except for qualifications and propose further studies. Target universities to engage ARC scientists as extraordinary professors to allow ARC employees to become primary supervisors of post-graduate students Support the nexus between research and education. Pooling strengths can generate rationalisation benefits (infrastructure expertise, staff from other divisions). Determine actual capacity for each campus and reallocate resources where needed to optimise post-graduate training. Increase appointments of research fellows (university professors). Increase intake of PDP students (NRF, DALRRD, DSI, AgriSETA). Review the PDP programme to ensure that it is the best professional development programme in the country. Leverage on the existing supervision / mentorship expertise for increased ARC-PDP student throughput. 	<ul style="list-style-type: none"> Increase the number of post graduate students training with intention to utilise them to uplift small scale farmers. Maintain the partnership with the Agricultural Sector Education & Training Authority (AgriSETA) to give bursaries to agricultural science students through our flagship Professional Development Programme (PDP). Source funding and students for 2024/25 training cycle. New post-graduate internships to be appointed. Secure funding for research projects for post graduate training. Establishment of CoEs, e.g., for Agricultural Engineering etc. Invest in infrastructure to accommodate more students (ICT network, shared office space, laboratory space). Increase appointments of research fellows (university professors). Increase intake of PDP students (NRF, DALRRD, DSI, AgriSETA). Establish formal and sustainable collaborations with universities through joint-appointments and associate professorship . Strengthen existing mechanisms and reward supervision / mentorship.
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 programmes to the drivers of national programmes. Prioritise project that are focusing on food security. Continue marketing the ARC as an implementer of applied research using, i.e., our website, and participation of core business national and international scientific meetings and/or symposia. Interaction with stakeholders to build a productive relationship. Marketing of ARC and outputs to producers. Industries need quicker answers than what MSc and PhD studies can offer. Sensitise/train the 	<ul style="list-style-type: none"> Market ARC capabilities at all possible platforms, using constantly updated research reports. Improve visibility of ARC programmes in provinces and national departments. Align our research priorities to the emerging small holder farmers. Quantum of PBR to be commercialised. Identify research products that can be scaled up, ready for uptake 'low hanging fruits'. Double the effort on Agro processing in order to address food wastage and shortage. Continue marketing the ARC as an implementer of applied research using, i.e., our website, and participation of core business national and international scientific meetings and/or symposia. Continue with interaction with stakeholders to continue with actively building relationship. The ARC must improve visibility. Training on the professional handling of consultations to new as well as established researchers.

INTERNAL ENVIRONMENT – STRENGTHS			
No.	Strength	What about the strength must be leveraged for the remainder of 2022/23?	What about the strength must be leveraged in 2023/24?
		<p>current researcher component on recognising and reacting on opportunities. Slogan for this internal campaign could be “Every question is a potential consultation”.</p> <ul style="list-style-type: none"> Identify national research agenda Our research output is novice and relevant. Improve turnaround times and implement delegation of authority at appropriate level. Consolidation of lessons learnt and highlights from the National Assets information campaign. 	<ul style="list-style-type: none"> Horticultural and physiology research has diminished to levels of almost being extinct in the ARC. In tree crops – horticultural research is equal to productive and efficient farming knowledge. Farmers especially small-scale farmers need new knowledge not repackaged knowledge. Align research priorities with institutional review. Engage stakeholders to identify research priorities which can be part of the National Research Agenda. Improve turnaround times more. Forge formal collaborations with national and provincial departments to ensure that ARC is the preferred R&D partner. Align and contribute to the objectives of the Agric Master Plan. Leverage research capabilities in support of diagnostic and pharmaceutical services. National Science Week. Develop new demand-responsive and tailor-made training courses. Re-design impact assessments in line with ARC mandate and contemporary national imperatives. Develop policy briefs / implications based on current research & innovation offers to enhance relevance. Engage with the ARC campuses for integration of socio-economic development issues in R&D programmes of national interest.
4	Assets infrastructure availability.	<p>and</p> <ul style="list-style-type: none"> Use available unused land and buildings to generate income. Use ARC website and social media resources to advertise products and services. Maintain current existing infrastructure. Maintain of infrastructure and assets where possible ARC farms should be an example of excellence – let's be the example. Submit an infrastructure and facility list to research division to prioritise current infrastructure. National Assets to be marketed more aggressively and linked to wider awareness of their value to RSA. Divisional assets must be pulled together for optimally use. Old redundant assets need to be auctioned and removed – proper housekeeping. Maintain current assets (including replacement of old assets). Availability of land and equipment for commercialisation. Implement the newly developed facilities hybrid management model. The implementation of the new Facilities Framework and Maintenance Management plan across the organisation has brought tremendous improvement in the efficiency and the management of the ARC Infrastructure and Assets. 	<ul style="list-style-type: none"> Implement the asset management plan and sell assets that are not required. Action plan to maintain and renew old infrastructure. Strategically plan innovation research ideas and plan implementation over time and relationship with funding model. Source/exploit funding options to purchase the best technology. Request internal proposal on consolidating and optimising infrastructure . Develop and implement asset management strategy. Continued awareness of ARC activities through social media resources. Maintain infrastructure to attract investment in ARC capabilities. Liaison with DARDLR on funding of the upgrading of the tractor laboratory. Old redundant assets need to be auctioned and removed – proper housekeeping. Investment in infrastructure renovations. Availability of land and equipment for commercialisation. Establish innovative partnerships with industry to ensure full utilisation of ARC assets and infrastructure. Marketing our infrastructure. The enhancement and utilisation for the ARC's Assets and Infrastructure to support core business and generate external income. Renewal/replacement where warranted.

INTERNAL ENVIRONMENT – STRENGTHS			
No.	Strength	What about the strength must be leveraged for the remainder of 2022/23?	What about the strength must be leveraged in 2023/24?
		<ul style="list-style-type: none"> Monitor availability and state of repair rigorously and determine priorities for renewal. 	
5	Ability to predict, identify and prevent pests and disease outbreaks.	<ul style="list-style-type: none"> Disseminate information to inform the development of an emergency response plan. Revive regular meetings with DALRRD on pests and diseases. Maintain and develop National PublicGood Assets. Identify the GAP in ARC regarding expertise – e.g., ARC-INF/NVB does not have a virologist anymore that can id grapevine diseases and/or deciduous fruit diseases. Coordinate activities across the Crop-based institutes in order to strengthen the current capacity Available expertise. Fully support processes with sound and tracked internal processes. Engage ARC campuses on conducting feasibility or baseline studies for impact assessments. 	<ul style="list-style-type: none"> Reassess and implement the strategy. Use the info gathered to plan large research projects and focuses that will address the GAP. Where there is an OVERLAP – draft a database of potential collaborators and/or submit proposals on collaboration. Where there is a lot of similar work being done in silos find a way of combining all these silos into a collaboration projects managed by ARC. Develop aggressive marketing campaign to demonstrate unique skillset within the ARC. Identify and address gaps in skill set value chain. Develop targeted strategies on specific high-profile areas for intervention or further development. Pursue funding opportunities for research on new pest and disease outbreaks. This technology must be fully marketed to commodity institutes of the ARC as well as external clients. Expand current technical capacity. Available expertise. Fully support processes with sound and tracked internal processes. Integrate economic modelling into early warning systems initiatives.
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. Develop an ARC wide programme on resilience. Desktop study on the OVERLAP as well as GAPS in current local and international research in the climate and other overarching agriculture risks. Application of Earth Observation products such as NDVI, PASG, for monitoring summer season for any potential agricultural risks. Application of precision agriculture to reduce current levels of inputs. Available expertise. Opportunities exist for increased collaboration on national, regional and continental level. Audit impact stories from research and innovation to best practices for possible scale-up. 	<ul style="list-style-type: none"> Build our capacity to become the partner of choice and to access funding. Establish collaboration networks to support the current skill set. Establish relevant Centres of Excellence. Development of early warning systems based on satellite observation data and climatic variables. Application of precision agriculture to reduce current levels of inputs. ARC still need increased Government funding to be able to address its mandate. Adherence to the strategic mandate of the ARC in order to make a difference in the lives of South Africans. Available expertise. Opportunities exist for increased collaboration on national, regional and continental level Drive strategic research in response to climate change. Develop new demand-responsive and tailor-made training courses. Promote CSA as ARC flagship programme. Leverage on existing evidence-based research output for scaling-up in different contexts.

INTERNAL ENVIRONMENT – STRENGTHS			
No.	Strength	What about the strength must be leveraged for the remainder of 2022/23?	What about the strength must be leveraged in 2023/24?
7	Clear strategic mandate.	<ul style="list-style-type: none"> Communicate ARC mandate to ARC staff, stakeholders, and the public. Improve the plight of small holder farmers. Still need increased Government funding to be able to address that mandate. Adherence to the strategic mandate of ARC in order to make a difference in social life of South Africans. Internal strategic workshops to unpack strategic mandate for each division at campus level to increase staff buy-in. Conduct Agricultural R&D on behalf of the nation and to save good national public good asset. Conduct both basic and apply agricultural R&D. 	<ul style="list-style-type: none"> Position ARC as the 'go to' organisation for Government regarding funded Agri-R&D. Database of small holder farmers in South Africa. Implement findings from ARC Review 2022. Monitor and evaluation of performance against strategic mandate. Conduct Agricultural R&D on behalf of the nation and to save good national public good asset. Conduct both basic and apply agricultural R&D.

INTERNAL ENVIRONMENT – WEAKNESSES			
No.	Weakness	What about the weakness must be managed for the remainder of 2022/23?	What about the weakness must be managed in 2023/24?
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 fully exploit commercialisation opportunities. Encourage participation (posters and oral presentations) of core business at national and international scientific meetings and/or symposia. Continue marketing the ARC as an implementer of applied research using, i.a., our website, and participation of core national and international scientific meetings and/or symposia. Marketing unit at ARC Central office need to be approached. Identify critical areas for improvement. Insufficient commercial acumen Develop plans/training/workshops for business acumen. 	<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 in the art of business brokering. Develop change management programmes to ensure ARC functions as a business. Encourage participation (posters and oral presentations) of core business at national and international scientific meetings and/or symposia. Continue marketing the ARC as an implementer of applied research using, i.a., our website, and participation of core national and international scientific meetings and/or symposia. A training strategy to build capacity of researchers. More training of researchers on commercial aspects. Marketing is an essential skill for any enterprises. It is important to develop this skill within business units of the ARC. This will enhance our capacity to attract revenue. Reallocate resources to improve exposure to critical stakeholders and/or commercial sectors. Capacity development in proposal writing. Insufficient commercial acumen. Support the effort of I&P Division in addressing these issues. Training and re-skill researchers and all managers in the ARC in the art of business brokering. Develop change management programmes to ensure the ARC functions as a business. Capacitation of commercialisation and marketing pipeline within the ARC.
2	Inadequate Marketing management and Stakeholder 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, PSA, RPO, Milk SA, NERPO, Cotton SA etc.). Engage with DALRRD and other Government departments (e.g., DSI, DEA, DTI, PDA's, IDC, ECDC, AfricaBio, etc.) considering ARC's financial situation. Have working sessions with researchers to obtain their inputs. Need more technical expertise within ARC marketing to recognise and optimise opportunities. Identify critical areas to improve marketing and reallocate 	<ul style="list-style-type: none"> Establish marketing strategy and stakeholder management plan. Develop a clear focused strategy. Who is the focus of marketing? Funders, producers, etc. Implement marketing strategy. ARC visibility at major national events. Regular stakeholder and client engagement Dedicated resources for marketing management (Opex and manpower). Have a dedicated site for marketing of ARC's technologies.

INTERNAL ENVIRONMENT – WEAKNESSES			
No.	Weakness	What about the weakness must be managed for the remainder of 2022/23?	What about the weakness must be managed in 2023/24?
		resources to develop suitable marketing material.	
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, DEA, DTI, PDA's, IDC, ECDC, AfricaBio, etc.) considering ARC's financial situation. Improve communication with our stakeholders. Need more technical expertise within ARC marketing to recognise and optimise opportunities. Improvement of stakeholder engagement skills. Shift mind from marketing myself to marketing the ARC. Inadequate stakeholder management at executive and senior management level. Identify critical strategic stakeholders and prioritise their engagement. 	<ul style="list-style-type: none"> Continuation of engagements with DALRRD and other Government departments (e.g., DSI, DEA, DTI, PDA's, IDC, ECDC, AfricaBio, etc.) considering ARC's financial situation. Link ARC as essential partner to Government's land-reform initiatives for optimal training of new farmers for sustainable agricultural production. Continuation of engagements with the Commodity Trusts (Maize Trust, Winter Cereal Trust, Hortgro, Winetech, PRF, OPOT, PSA, Cotton SA, Tobacco Industry etc.). Increased and active identification of private partners who might want to partner with ARC, e.g., pharmaceutical companies, food and beverages companies, etc. Communicate our strategic objectives with stakeholders. Building relationships from ground level. Allow researchers to casually interact with producers, e.g. breeders know cultivars bests and should be in the orchards/fields with the farmers. More regular interaction with stakeholders on the MS Teams platform, and face-to-face meetings Identify and prioritise stakeholder engagements per thematic area and not only per campus. ARC visibility at major national events. Regular stakeholder and client engagement. Engage with stakeholder in both national and provincial government departments. Engage with private stakeholders. Appoint teams to work on marketing cross cutting functional areas. Inadequate stakeholder management at executive and senior management level. Develop strategic stakeholder register with clear stakeholder management activities. Host stakeholders' day to showcase newly developed cultivars and breeds.
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 employment equity targets and reactivate the transformation committees at Campus level. Expedite the succession planning implementation and the organisation design 	<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 Long term succession planning Implement new ways of recruiting RTMs from within. The remuneration policy must be updated to include notch levels so that employees can be motivated to move to higher notch. Monitor and measure the success of the implementation plans and redefine to ensure alignment to the targets. Incorporate succession planning and training of junior staff as a Key performance indicator

INTERNAL ENVIRONMENT – WEAKNESSES			
No.	Weakness	What about the weakness must be managed for the remainder of 2022/23?	What about the weakness must be managed in 2023/24?
		<p>recommendations to ensure sufficient critical mass.</p> <ul style="list-style-type: none"> Communicate the importance of succession planning to all ARC staff. Targeted recruitment of skilled and capable workforce. Redeployment/reskilling existing personnel where relevant. There is no desire to implement succession planning. Make an inventory with of personnel that will retirement within the next six months as well as the potential loss of personnel to external companies as well as movement to other divisions/campuses in the ARC and the negative impact thereof. Develop and sign off on a mitigating plan in each case. Ability to pay more to retain and attract critical skilled employees. Aging work force threaten business continuity. Senior personnel must be encouraged to transfer skills to young employees. Succession plans for various business divisions of ARC should be fully implemented. Management of succession/handover before the senior person retires should have sufficient resources [As is, it is impossible to get someone one to understudy the person going out of ARC because there are no resources. Identify current gaps in expertise within the ARC, as well as areas for current aging work force Aging work force, inadequate succession planning and lack of critical mass. Workshop the Succession Plan and the Coaching and Mentoring policies. 	<p>(KPI) into Performance agreements of line managers.</p> <ul style="list-style-type: none"> Appoint new staff to enable retirees to train them adequately. Draft a long-term career path with action plans with milestones per person to mitigate future losses. Add this milestone to the PDA. Review organisational structure to ensure positions for successors. Appointment of new staff to fill current vacancies. Practical on the job training of understudy candidates. Currently ARC is engaged in High Human Capital Development training quite several students in various fields. Once they graduate, these students can then be absorbed to boost the ARC workforce. Leveraging on the Agric. Eng CoE to train the next generation of engineers. Appoint more skilled and trained staff. Implement a structured succession plan and staff development to address critical areas with lack of critical mass. Aging work force, inadequate succession planning and lack of critical mass. Develop SMART targets for succession planning that should be tracked as part of APP. Have succession plans that are actively monitored and link to an internal promotion strategy. Implement the post retirement and mentoring strategy.
5	Ageing infrastructure.	<ul style="list-style-type: none"> Identify reliable equipment that can be shared. Investigate medium-term leasing of more ARC facilities based on upgrading of the facilities in exchange for reduced initial rental amounts. Buildings need to be maintained to prevent long term damage. Identify critical areas for investment. Identify new areas for establishment. The aging Infrastructure both in ICT and Facilities over the past few years have played a significant 	<ul style="list-style-type: none"> Prioritisation of CAPEX at an organisational level. Dispose of obsolete equipment. Conduct infrastructure audit Strategic and economic cost-benefit analysis of all infrastructure assets. Appoint competent maintenance service providers on contracts to stop the

INTERNAL ENVIRONMENT – WEAKNESSES			
No.	Weakness	What about the weakness must be managed for the remainder of 2022/23?	What about the weakness must be managed in 2023/24?
		<ul style="list-style-type: none"> role in the deterioration of service delivery to the business. Budget constraints that hinder the maintenance and/or replacement of ageing infrastructure. Inadequate maintenance of the ageing infrastructure. Monitor and prioritise interventions 	<ul style="list-style-type: none"> chaotic SCM rotation of sub-standard contractors. Develop a long-term up-grading strategy and find sponsors to fund. 'New CAPEX on externally funded contracts Effective management of maintenance plans. Investment in infrastructure renovations. Investment in new infrastructure. Ageing infrastructure. Develop a corporate infrastructure revitalisation plan with medium term targets and cost implication Introducing the outsourced model for our ICT Infrastructure to alleviate the effects of the obsolete infrastructure. Monitor and prioritise interventions.
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 An internal research symposium is planned for January 2023 that will introduce and showcase the ARC divisions internally Establish up-to-date skills list within ARC, including contact details and CVs. Business units should be encouraged to submit a joint proposal that have different components are geared at developing the agricultural sector. Coordinate activities across the Crop-based institutes in order to strengthen the current capacity Explore potential partnerships between business units across ARC campuses. 	<ul style="list-style-type: none"> Adopt a multidisciplinary research team approach. Create a skills data base that can be regularly updated. Institute and incentivise a programme approach. Joint project development\ Use technology to create ARC research platforms across research institutes Have annual research forums. Business units should be encouraged to submit a joint proposal that have different components that are geared at developing the agricultural sector. Identify champions within the different campuses to lead workshops and activities to unify researchers across different campuses. Improvement on internal communication and information sharing. Promote social engagement amongst staff Support intercampus forum activities, including conference. Enhance partnerships between business units across ARC campuses (leverage on the ARC Research Forum).
7	ARC processes are not technologically advanced.	<ul style="list-style-type: none"> Identify areas for automation of internal processes. Technologically advanced does not necessarily equate to efficient and practical processes. Classical ways of conducting research still role to play. Need to do a survey of where our technology is lagging. The fully automated ARC process will improve the turnaround time. Need to operate more effective and efficient. Internal capacity building in current available technology (SharePoint, OneDrive, Teams, Power BI) ARC processes are not technologically advanced (HR, 	<ul style="list-style-type: none"> Automate and streamline critical internal processes. Technologically advanced doesn't necessarily equate to efficient and practical processes. Classical ways of conducting research still role to play. Invest in new technologies to be on power with private competitors. Implement new AX system. The fully automated ARC process will improve the turnaround time. Need to operate more effective and efficient. Internal capacity building in coding and 4IR ARC processes are not technologically advanced (HR, Facilities & general support services). Implementation of a Digitisation Strategy and drive to modernise the ARC's technological operations. Appoint services provider for the services.

INTERNAL ENVIRONMENT – WEAKNESSES			
No.	Weakness	What about the weakness must be managed for the remainder of 2022/23?	What about the weakness must be managed in 2023/24?
		Facilities & general support services). <ul style="list-style-type: none"> ▪ Lack of a Digitisation Strategy and modernisation of the ARC's technological operations. ▪ Ensure that the ERP implementation is aligned to the current technology trends and the organisational design structures are aligned to roles, workflows, networks, and procedures for efficiency. ▪ Plan for ARC processes to be ISO accredited. 	
8	Lack of operational agility within the support systems	<ul style="list-style-type: none"> ▪ Streamline the functions of support systems and get them ready for 2022/23. ▪ Improve the turnaround time with documents. ▪ The support systems need to be made aware that the success of research projects are dependent on their support ▪ Increase productivity of support staff and systems (Eskom currently not helping) ▪ Most definitely – SCM is the greatest threat to many of our processes and keeping clients happy. ▪ Ageing and outdated support systems. ▪ Efficient supply chain, marketing, business support, ICT, library services, legal services. ▪ Improve turnaround times and implement delegation of authority at appropriate level. ▪ Lack of operational agility within the support systems ▪ Implement, adapt and monitor interventions agreed upon at September 2021 SEMP CO on business processes 	<ul style="list-style-type: none"> ▪ Establish commercial entity for the ARC as the weaknesses are attributed largely to PFMA. ▪ Support services must know that they are part of the research projects. ▪ Train support staff in farming and research principles to create and understanding in why their prompt reaction is essential. ▪ Identify and address sources of lack of agility. ▪ Develop practical solutions within the confines of the PFMA for procurement such as contracting. ▪ Efficient supply chain, marketing, business support, ICT, library services, legal services. ▪ Internal capacity development, adaptation and implementation of new technologies ▪ Lack of operational agility within the support systems. ▪ Revise the delegations of authority to enhance decision making. ▪ Implement, adapt and monitor interventions agreed upon at September 2021 SEMP CO on business processes.

EXTERNAL ENVIRONMENT – OPPORTUNITIES			
No.	Opportunities	What about the opportunities must be exploited for the remainder of 2022/23?	What about the opportunities can be exploited in 2023/24?
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 2022/23. Identify key products that can be sold, service products and infrastructure Develop manuals and research reports for dissemination in the country and region. Have legally binding contracts with IP protection in place that are transparent to all stakeholders/partners involved. ARC must be present. Implement commercialisation strategy. Hold more events, e.g. open days, webinars etc. Use an ARC list of contacts to investigate more potential clients. Commercialisation of research products. Identify and prioritise low hanging fruit for exploitation Develop commercialisation and enterprise development plan. Exploitation, marketing and commercialisation of products, services and marketing of our IP. Growing the external revenue through improved stakeholder relations. 	<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 Have legally binding contracts with IP protection in place that are transparent to all stakeholders/partners involved. Excellent business plans is needed to commercialise products if we want to compete with commercial farmers within a PFM system. Actively involve researchers to market their inventions/IP. All products of the ARC must first and foremost brand the ARC Focus on partnerships, franchising and/or SMME formation to take products to mainstream the commercial domain rather than self-production. Use ARC products in combination with business funding opportunities to start Implement commercialisation strategy' Reallocate resources to implement commercialisation plan Exploitation, marketing and commercialisation of products, services and marketing of our IP. Develop an implementation plan for the commercialisation ARC commercialisation strategy. Increase skilled OTT capacity at campuses and at least two Business Development Managers Appoint IP and Commercialisation scouts (staff) at campus for visibility. Series Sessions for Commercialisation of technologies with experts and industry partners. Breakfast/lunch session for match-making or pinching session for the industry / cooperates Appoint panel of Fund Manager for the Spin-off services for new deals.
2	Focused 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. 	<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. Use research farms to generate revenue Continue marketing the ARC as an implementer of applied research as well as our Research Services using, i.e., our website, and participation of core national

EXTERNAL ENVIRONMENT – OPPORTUNITIES			
No.	Opportunities	What about the opportunities must be exploited for the remainder of 2022/23?	What about the opportunities can be exploited in 2023/24?
		food industry for pathogen profiling and quality assurance. <ul style="list-style-type: none"> Rental part of our farms that are not utilised. Continue marketing the ARC as an implementer of applied research as well as our Research Services using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. Investigate medium-term leasing of more ARC facilities based on upgrading of the facilities in exchange for reduced initial rental amounts. Develop asset management plan for income generation'. Start implementing plans for revenue generation. Focussed revenue generation strategies using physical assets. Aggressively market the ARC assets through tender for potential lessee – consider activities for partnership on lease. 	and international scientific meetings and/or symposia. <ul style="list-style-type: none"> Implement asset management plan for income generation. Lease unused properties'. Monitor and evaluate performance against business plan. Focussed revenue generation strategies using physical assets. Continuous aggressive marketing of ARC assets. Develop feasibility studies / business plans/cases on existing assets towards potential revenue generation.
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 analyses and diagnostics. Continue marketing the ARC as an implementer of applied research as well as our Research Services using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. Fast-track appointments in these areas across all campuses – currently under critical mass' Be aware of potential threads Optimise techniques needed for rapid detection. Develop a model of including SMME on this field to reduce the monopoly on developing vaccines. 	<ul style="list-style-type: none"> Consolidate all diagnostic competencies virtually. Articulate ARC capabilities. Generate revenue from analyses and diagnostics. Initiate sensitisation and marketing of FMD vaccine to be produced from new factory Continue marketing the ARC as an implementer of applied research as well as our Research Services using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. Aggressive marketing on why ARC's services is unique or better than competition Ensure fully capacitated responsive research and development value chain to emerging pests and diseases. Early warning systems Reallocate resources when needed Visibility of the ARC and partners on vaccine development
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' Continue marketing the ARC as an implementer of applied research as well as our Research Services using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. Reinstate competency review process. Establish an ARC-wide list of potential partners. Almost all 	<ul style="list-style-type: none"> Implement the plan. International relations strategy. Marketing strategy. Exploitation of international markets for commercialisation. Develop Seed Fund for technology advancement. Create an Agriculture University in partnership with one/several universities in SA. Focus on postgraduate qualifications and develop this university 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 DHE to

EXTERNAL ENVIRONMENT – OPPORTUNITIES			
No.	Opportunities	What about the opportunities must be exploited for the remainder of 2022/23?	What about the opportunities can be exploited in 2023/24?
		<p>researchers have many contacts, but they are not shared or known more widely, leading to lost opportunities.</p> <ul style="list-style-type: none"> Improved relationship between institutes. Sharing of knowledge. 	<p>develop a model that incentivise the ARC further.</p> <ul style="list-style-type: none"> Develop more structured training modules that are recognised by AgriSETA. Continue marketing the ARC as an implementer of applied research as well as our Research Services using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. Create opportunities for researchers to be seen by potential partners, encourage physical interactions to build relationships, e.g. at meetings and/or symposia. Reinstate competency review process Identify and focus on our true areas of excellence as identified by outside peers and collaborators/funders/stakeholders. Exchange programs, sabbaticals. Establish Center of Excellence in strategic areas such as climate change.
5	Potential to become regional agricultural hub. (Part of International opportunity)	<ul style="list-style-type: none"> Regional collaborative partners. Establish broader Centres of collaboration. Continue our partnership with WcDOA, especially considering minister Thoko Didiza's and Dr Mogale Sebopetsa, Head of Department, WCDoA who emphasised the role of the ARC as implementor to ensure technologies reach ground level (small-holder, subsistence farmers etc.). Fully embrace 4th industrial revolution. Improve regional collaborations. Potential to become regional agricultural hub. Set up team to identify niche hubs. 	<ul style="list-style-type: none"> Establish regional bilateral and collaborations. Exploitation of reference laboratories. Establish an agricultural innovation hub in the Roodeplaat campus of the ARC. Develop a strategy and implementation plan to establish an agricultural research, innovation, and incubation centre. Continue our partnership with WcDOA, especially in light of Minister Thoko Didiza's and Dr Mogale Sebopetsa, Head of Department, WCDoA who emphasised the role of the ARC as implementor to ensure technologies reach ground level (small-holder, subsistence farmers etc.). Recruit the best African and international scientists we can get to become a truly regional expertise hub. Lobby for international funding to power the Hub. Explore opportunities with international organisations for conservation of valuable germplasm (IPGRI, Conservation International). This would be one of the functions to support operation of a regional hub. Digitisation of ARC systems Potential to become regional agricultural hub. Develop a strategy/guidelines and implementation of plan for establishing niche agricultural research, innovation, and incubation – leverage of funding agency to partner on this initiative (SEDA, TIA etc.)
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. Continue our partnership with WcDOA, especially in light of Minister Thoko Didiza's and Dr Mogale Sebopetsa, Head of Department, WCDoA who emphasised the role of the ARC as implementor to ensure technologies reach ground level 	<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. Continue our partnership with WcDOA, especially in light of Minister Thoko Didiza's and Dr Mogale Sebopetsa, Head of Department, WCDoA who emphasised the role of the ARC as implementor to ensure

EXTERNAL ENVIRONMENT – OPPORTUNITIES			
No.	Opportunities	What about the opportunities must be exploited for the remainder of 2022/23?	What about the opportunities can be exploited in 2023/24?
		(small-holder, subsistence farmers etc.) <ul style="list-style-type: none"> ▪ Joint research projects. ▪ Determine actual capacity for each campus and reallocate resources where needed to optimise training potential. ▪ Capacity development with local and continental partners. 	technologies reach ground level (small-holder, subsistence farmers etc.). <ul style="list-style-type: none"> ▪ Agricultural is a competitive environment and producers/partners need the best relevant new technology to ensure a success path towards the future. ▪ Develop business skills to ensure successful agri-businesses. ▪ Prioritise and fund specific interventions as identified by business units. ▪ Exchange programs, sabbaticals. ▪ PhD sandwich programmes/exchange ▪ Invest in infrastructure to accommodate more people (ICT network, shared office space, laboratory space). ▪ Capacity development with local and continental partners. ▪ Develop new demand-responsive and tailor-made training courses.
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. ▪ Professional brochures that describe the ARC's services and value. ▪ Improve our extension service ▪ Continue marketing the ARC as an implementer of applied research as well as our Research Services using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. ▪ Many of these are at subsistence or community level, and so do not have funds to pay. Need to try and get funding to help them. ▪ Opportunity for mass food production. ▪ High demand for agricultural services. ▪ Set up teams to bench mark services for activities rendered by the ARC (pricing model). 	<ul style="list-style-type: none"> ▪ Dedicated marketing showcasing capabilities. ▪ Establish coordinated sample receiving/testing one-stop centres in various provinces as part of a coordinated diagnostic services offered by the ARC. ▪ 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. ▪ Improve our extension services to generate revenue. ▪ Continue marketing the ARC as an implementer of applied research as well as our Research Services using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. ▪ Agricultural is a competitive environment and producers want high quality services, promptly. ▪ Marketing campaigns aimed at thematic areas. ▪ High demand for agricultural services. ▪ Establish an ARC Enterprise Office to coordinate provision of agricultural services ▪ Develop market related pricing model (lack of market related pricing models impact the economic outputs of the country on agricultural services and monopolise the services – competition commission matter)

EXTERNAL ENVIRONMENT – THREATS			
No.	Threat	What about the threat must be mitigated for the remainder of 2022/23?	What about the threat can be mitigated in 2023/24?
1	Inadequate/ Reduction of the Parliamentary Grant	<ul style="list-style-type: none"> Revisit the allocation of PG in the ARC. 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 programmes 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 Launch a national appeal based on the importance of publicly funded agricultural R&D – benchmark the ARC's public funding with countries that have a similarly competitive agricultural sector. ARC needs to be efficient in managing resources. Lobby like crazy, not only with DALRRD, but all departments. Create powerful awareness campaigns. Hold outreach events. Government must realise that having a national research organisation that is still expected to be a commercial entity is unrealistic. ARC should be preferred client for DALRRD Perform project reviews to evaluate actual performance. Evaluate current income generation initiatives. Realign strategy and resources if needed to improve current strategy for income generation. 	<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 licensing 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 do not create value for the ARC and absorb 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. The ARC through the CEO and Senior Management need to lobby for funds. Implement improved strategy for income generation. Implement a sustained public awareness campaign to enhance appreciation of the work of the ARC by the public and parliament.

EXTERNAL ENVIRONMENT – THREATS			
No.	Threat	What about the threat must be mitigated for the remainder of 2022/23?	What about the threat can be mitigated in 2023/24?
			<ul style="list-style-type: none"> ▪ Defined delegations of authority and much shorter decision turnaround times. ▪ Actively pursue international funding opportunities. ▪ PG funding should be aligned with programmes that are of national interest. ▪ Involve researchers in lobby actions. ▪ Lobby Government with evidence of impact of ARC.
2	Loss of external income	<ul style="list-style-type: none"> ▪ High-level intervention of CEO, GE and SM with relevant stakeholders (Commodity trusts and Departments (DALRRD, DFFE). ▪ Create professional brochures of ARC expertise and services on offer. ▪ Efficient support systems should be improved. E.g. Sometimes it takes too long to get approval on submissions ▪ Encourage core business to submit research proposals. ▪ Effective communication with funders: big and small. ▪ Draft a report on the main reasons for loss of income. ▪ Find immediate solutions to ARC's turnaround time on contracts and eliminate all unnecessary red tape. ▪ Create a, Innovation Hub for personnel to drop innovative ideas and proposals that are currently being suffocated by red tape and long submission pathways ▪ Deliver excellent results for DALRRD (new SLA). ▪ Better communication between campuses to produce stronger proposals. ▪ Improving revenue generation and current services such as the labs. ▪ Support in the ARC for project implementation. ▪ Perform project reviews to evaluate actual performance. ▪ Evaluate current income generation initiatives. ▪ Realign strategy and resources if needed to improve current strategy for income generation. ▪ Loss of external income. ▪ Explore solicited and unsolicited funding opportunities. 	<ul style="list-style-type: none"> ▪ Implement relationship improvement plan with Commodity Trust partners. ▪ DALRRD and ARC, including all institutes 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 with a business model that will ensure that the ARC benefits 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 DHE to develop a model that incentivise the ARC further. ▪ Lease or sell unused properties/farms, etc. and recapitalise others for future growth. ▪ The income generated will be reduced when benefit sharing is implemented. ▪ Establish Projects Office for grants scoping and vigorous fundraising. ▪ Efficient way of managing our external clients. ▪ Encourage core business to submit research proposals. ▪ Understand why ARC loses income. ▪ Implement the new competency Framework. ▪ Capacitate internal support systems to deliver excellent, relevant research results for core. ▪ Better communication between campuses to produce stronger proposals. ▪ Improving revenue generation and current services such as the labs. ▪ Implement improved strategy for income generation. ▪ Loss of external income. ▪ Provincial roadshows to showcase provincially aligned R&D. ▪ Explore other funding models wherein ARC can partner 50%/50% with Funding Agencies for technology advancements. ▪ Develop proposals towards solicited and unsolicited calls (through enhanced internal and external collaboration).

EXTERNAL ENVIRONMENT – THREATS			
No.	Threat	What about the threat must be mitigated for the remainder of 2022/23?	What about the threat can be mitigated in 2023/24?
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 the ARC (personnel costs). Improve turnaround time by bringing forward project initiation. Collaboration and partnerships Reduce our overheads on research proposals. Refer to the point above. Submit long term proposals such as breeding proposals that can still be concluded within 3 months. Better communication between campuses to produce stronger proposals. Institutional collaboration to submit joint proposals. Competitive market rates. Other organisations encroach on ARC mandates. Improve collaboration within the ARC and between local organisations. Enhance multi-disciplinary partnerships (internal and external) for competitive research funding proposals. 	<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. Diversify 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. Develop pricing strategy for training services Establish Projects Office for grants scoping and vigorous fundraising. Our research proposals are expensive as compared to our competitors. Refer to the point above. ARC must clearly understand who our competitors are and why. Most competitors were trained in the ARC. Outperform competition. Collaborate with competitors where possible Deliver excellent research results. Ensure a full value chain of scarce skill sets. A research support office that searches for new calls amongst other tasks. Strengthen collaborations, internally, local and international. More support should be provided to the Inter-campus Research Forum. Develop new demand-responsive and tailor-made training courses. Enhance multi-disciplinary partnerships (internal and external) for competitive research funding proposal.

EXTERNAL ENVIRONMENT – THREATS			
No.	Threat	What about the threat must be mitigated for the remainder of 2022/23?	What about the threat can be mitigated in 2023/24?
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. Establish a circular agriculture think tank and align with similar approaches globally. Water harvesting systems where possible. Rainwater harvesting technologies and borehole water use. Identify climate adaptive technologies to be installed at campus level. Climate change. 	<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. Forecast and align 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 Water harvesting from ARC rooftops for use in gardens etc. Move ARC buildings and farms towards recycle, reuse, and reduce concept. .Water harvesting systems where possible. Adopt water conservation technologies and practices Promote CSA as ARC flagship programme Regard, and market the ARC competencies more actively. ARC wide plan driven by all is required. Invest in climate adaptive technologies at campus level. Promote CSA as ARC flagship programme
5	Reduced industry support for ARC programmes/ARC losing impact	<ul style="list-style-type: none"> Identify the negative perceptions at the Commodity Trusts. Engage with the Commodity Trusts (Maize Trust, Winter Cereal Trust, Hortgro, Winetech, PRF, OPOT, PSA, etc.). Stakeholder engagement, develop institute research reports. Have a better relationship with industry partners. Encourage participation (posters and oral presentations) of core business at national and international scientific meetings and/or symposia. Continue marketing the ARC as an implementer of applied research using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. Conduct a root cause analysis and mitigate on the outcomes. High level stakeholder engagement is required. Refocus work to be relevant for the country (not just SHF). Insufficient stakeholder management. Increase public awareness of climate change through webinars. Explore potential PDP study areas on issues of impact on national issues. 	<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 are 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. Improve our communication with the funders Encourage participation (posters and oral presentations) of core business at national and international scientific meetings and/or symposia. Continue marketing the ARC as an implementer of applied research using, i.e., our website, and participation of core national and international scientific meetings and/or symposia. Improve relationship with big commercial farmers and the message will spread if ARC make an impact on that level. Do relevant research. What do farmers want? Or are we true to our constitutional mandate? What can we do, to improve SA's farmer's day to day challenges? ARC must be more professional in how we conduct business – accountability throughout all processes. Develop a Smart Agriculture research focus (the use of technology in agriculture to make

EXTERNAL ENVIRONMENT – THREATS			
No.	Threat	What about the threat must be mitigated for the remainder of 2022/23?	What about the threat can be mitigated in 2023/24?
			<p>tasks easier and improve outcome) research focus.</p> <ul style="list-style-type: none"> ▪ Market the new research concepts to the industry. ▪ Conduct a root cause analysis and mitigate on the outcomes. ▪ Increase efforts to market the specific ARC impact on target commodity industries. ▪ Rebrand ARC and PR strategy. ▪ Renewed effort to improve relationship with industry stakeholders. ▪ Insufficient stakeholder management. ▪ Develop and submit policy briefs / implications on ARC research programmes on impact on national issues. ▪ Re-focus PDP programme towards postgraduate studies of national interest.
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 etc.) to understand their pricing structures. ▪ Develop in-house chemistries and protocols to lower costs of generating data. ▪ Support local technology providers rather than source from international providers. ▪ Inconsistent/lack of reliable electricity and water supply causing interruptions in experimental procedures and may cause damage to equipment and NPGAs. ▪ Implement renewable energy. ▪ Optimise work efficiency (coordinate work within the team to avoid duplication of activities). ▪ Investigate alternative ways to perform work. ▪ Rising input costs in the research environment (consumables, electricity, travel, etc.). 	<ul style="list-style-type: none"> ▪ Commission a study to develop an energy saving strategy for the ARC. ▪ Implement a plan to get the ARC off the electricity grid and fund it, it will require capital expenditure, but will realise a significant amount of savings for other operations. ▪ Implement the coordinated bulk-buying project for research consumables. ▪ Exploit ICT for virtual delivery of scientific services where possible. ▪ Prioritise research efforts, and close-down programmes that have high expenses and obsolete equipment. ▪ Inconsistent/lack of reliable electricity and water supply causing interruptions in experimental procedures and may cause damage to equipment and NPGAs. ▪ Implement renewable energy. ▪ Internal capacity development in innovative thinking. ▪ Rising input costs in the research environment (consumables, electricity, travel, etc.).
8	COVID-19	<ul style="list-style-type: none"> ▪ Implement the ARC Pandemic Management Plan ▪ Increase awareness about the pandemic ▪ Inability of ARC researchers to travel internationally on funded projects. ▪ All procedures are sufficient ▪ Prepare short-, medium- and long-term response plans. ▪ Adhere to good hygiene and follow WHO and DoH protocols/guidelines. 	<ul style="list-style-type: none"> ▪ Implement the ARC Pandemic Management Plan. ▪ Increase awareness about the pandemic. ▪ Use remote working arrangement where possible. ▪ Implement vaccine education programme, as part of wellness ▪ Prepare short-, medium- and long-term response plans. ▪ Adhere to good hygiene and follow WHO and DoH protocols/guidelines. ▪ Review areas for improvement in case of new pandemic (implement lessons learned in advance and do not wait for the next pandemic) ▪ Adoption of Digital training as alternative to physical training

EXTERNAL ENVIRONMENT – THREATS			
No.	Threat	What about the threat must be mitigated for the remainder of 2022/23?	What about the threat can be mitigated in 2023/24?
9	Land-grabs	<ul style="list-style-type: none"> Title deeds to be properly managed- Indicate the importance of keeping the land, e.g. food security. Increase awareness about possible land grabs Develop an action plan to address such incidents Improve security measures Prepare short-, medium- and long-term response plans. Improve security of ARC properties e.g., fencing, use of technology and where possible renting the property. Update disaster recovery plan and battle box Monitor illegal land use and act immediately Consider modalities to partner with former employers 	<ul style="list-style-type: none"> ARC to utilise the land in a way that we can demonstrate to our government the importance of keeping the land. So that we can defend ownership should the need arise Increase awareness about possible land grabs Develop an action plan to address such incidents Prepare short-, medium- and long-term response plans. Improve security of ARC properties e.g., fencing, use of technology and where possible renting the property. Monitor illegal land use and act immediately Appoint overseer at different campus specific field for loss of IP
10	Inadequate/ Reduction of Parliamentary Grant	<ul style="list-style-type: none"> Revisit the allocation of PG in the ARC. 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 programmes 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. Launch a national appeal based on the importance of publicly funded agricultural R&D – benchmark the ARC's public funding with 	<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 licensing 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 do not create value for the ARC and absorb money that could be used elsewhere and use the income

EXTERNAL ENVIRONMENT – THREATS			
No.	Threat	What about the threat must be mitigated for the remainder of 2022/23?	What about the threat can be mitigated in 2023/24?
		<p>countries that have a similarly competitive agricultural sector.</p> <ul style="list-style-type: none"> ARC needs to be efficient in managing resources. Lobby like crazy, not only with DALRRD, but all departments. Create powerful awareness campaigns. Hold outreach events. Government must realise that having a national research organisation that is still expected to be a commercial entity is unrealistic. ARC should be preferred client for DALRRD. Perform project reviews to evaluate actual performance. Evaluate current income generation initiatives. Realign strategy and resources if needed to improve current strategy for income generation. 	<p>generated from sales/leases to recapitalise other areas of growth.</p> <ul style="list-style-type: none"> 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. The ARC through the CEO and Senior Management need to lobby for funds. Implement improved strategy for income generation. Due to insufficient management. Implement a sustained public awareness campaign to enhance appreciation of the work of the ARC by the public and parliament.

UPDATED PESTEL ANALYSIS – INFORMING 2023/24 PLANNING

POLITICAL ANALYSIS
<ul style="list-style-type: none"> • Stalled Land reform dynamics. • Changes in national political context, growing and often unstable coalition politics. • Increased political tensions in the country. (Including tensions in the Governing Party). • Changes in SADC countries e.g., Leadership changes resulting in instability. • National Development Plan and other government programmes e.g., Agriculture and Agro-processing Masterplan (AAMP). • 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. • Changes in international geo-politics and the impact on trade and scientific collaboration e.g. Russia-Ukraine conflict. • Increased levels of unrest in South Africa linked to poverty, xenophobia, lack of service delivery in several municipalities, some of which are politically inspired. • Impact of pandemics, such as Covid-19 and future pandemics on global and local politics and controversial interventions (state of emergency, travel restrictions, interruptions in international supply chains, employment and business rescue challenges globally and nationally). • International trends on competitiveness for funding for R & D. • Infrastructure issues, electricity network breakdown, transport (rail, road, harbour) failure. • International transboundary Water issues. • Radicalisation of politics due to deprivation. • Impact of conflicts in Africa and Ukraine on global and local politics, interruptions in international supply chains, reallocation of resources to conflict areas. • Global warfare (Artificial intelligence and conflict).
ECONOMIC ANALYSIS
<ul style="list-style-type: none"> • National economic uncertainty due to unreliable energy supply. • Capability of SHF to participate in commercial agriculture. • Limited market access for SHF. • Decline of SHF agricultural production due to increasing levels of pests and diseases associated with climate change. • Decline of SHF agricultural production due to increase in input costs. • The lack of infrastructure development and maintenance. • Competitiveness of commercial agriculture. • Low profit margin in agriculture (both commercial and SHF) due to significant increases in inputs costs, including energy (electricity and fuel), fertilizers, and labour, without limited increase produce value. • Global economic fluctuations including price fluctuation of commodities associated with climate change. • The exchange rate and its impact on trade. • Tariff and non-tariff trade barriers. • African Continental Free Trade Agreement. • ARC access to funding. • Global free trade agreements. • National strategies and imperatives. • Energy, food and water security. • Changing international investment in energy generation capacity. • Public health implications from pests and diseases (e.g., Covid-19, zoonotic diseases). • Fourth, fifth and sixth industrial revolution. • Depreciating rand exchange rate and unaffordability of new imported technologies. • Corporatisation – vertical integration. • Credit rating downgrade. • Social grant bill increases. • Economic recession/stagnation. • Impact of emerging diseases on the global, regional and national economies. • Increased competitiveness of the agricultural sector. • Lack of prioritisation of agricultural R&D, despite agricultural sector being a key driver of the SA economy. Immediate impact may not be visible, but long-term impact will be detrimental. • Implementation of circular economic development initiatives. • Significantly increased cost of doing business. • Impact of limited energy supply. • ARC's access to niche market for commercialisation of its technologies. • Market penetration of the ARC technologies. • Increasing food inflation. • Impact of Russia-Ukraine war on the global, regional and national economies, especially on food supply chains. • Reduction in exports / increased imports and impact on national economy. • Disruptions in- and vulnerability of food systems and value chains to global change challenges.

SOCIAL ANALYSIS
<ul style="list-style-type: none"> • Impact of emerging diseases on the social inequalities, including gender, race and ethnic disparities increasing due to the continued social deprivation. • Levels of skills and education in society; lack of innovation / entrepreneurial skills. • National standards of living especially of the rural poor as a result of failing infrastructure, food inflation • Accelerating loss of expertise and skills from the ARC and other SOEs. • Chronic levels of unemployment, especially amongst the youth. • Extent of reliance on social grants. • Food and nutritional safety and security. • Unplanned urbanisation and lack of investment for urbanisation. • Population dynamics and urbanisation. • Social capital 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. • Impact of agricultural pests and diseases on homestead food security and social cohesion. • Radicalisation of youth and unemployed due to social deprivation. • Political unrest interfering with research activities. • Changing consumer tastes and preferences. • Increased poverty and unemployment resulting in increased hunger and malnutrition. • Increasing migration of people to South Africa due to economic stagnation, corruption, climate change and political unrest. • Increased cost of living challenges.
TECHNOLOGICAL ANALYSIS
<ul style="list-style-type: none"> • Increased multidisciplinary nature of science and technology. • Increased importance of circular agriculture, Agroecology, conservation agriculture • Increased importance of lifestyle changes – veganism, more plant-based proteins, etc. • Impact of social media platforms. • New technology applications in agriculture, e.g., drones, gene editing, automated hydroponics infrastructure. • Rate of technology adoption (diffusion curves). • S-curves (analysis of skills, knowledge, and technology). • Application of artificial intelligence and block-chain technology. • Cost of technology becoming unaffordable due to depreciating Rand exchange rate. • Big data analytics in agriculture. • Smart and precision agriculture. • Internet of Things – IOT. • Precision Agriculture. • 4th Industrial Revolution (4IR). • HR Metaverse. • Internet of things: Interactive software applications based on smart devices. • Covid-19 resulted in the increased use of virtual platforms for many business processes, stakeholder management; research; diagnostics; training; advisory services, etc. • New technologies such as the use of drones and satellite imaging for monitoring of research trials, commercial plantings, and data capturing can increase research outputs. • Emerging focus on renewable and sustainable energy.
ENVIRONMENTAL ANALYSIS
<ul style="list-style-type: none"> • Impacts of climate change & climate variability on agricultural production. Shifting production regions, planting times, etc. • Shifting production regions. • Competing land use priorities (mining activities, urban development, etc.). • Increased incidences of natural disasters and large fluctuations in climatic conditions due to climate change e.g., veld fires, heat waves, floods and drought. • Decreasing of arable land. • Ability to regenerate degraded land for agricultural production. • Halting and active reversing of desertification of marginal lands. • Energy mix and availability with emphasis on renewables. • Waste management and its implications for agriculture. • Environmental pollution and biomagnification, e.g. neonicotinoids. • Sustainable use of natural resources. • Access to clean water. • Pest and disease outbreaks may intensify due to climate change. • New exotic pests and diseases invade South Africa and threaten agricultural production. • Threats to biodiversity, from climate change, land use threats and invasive alien species. • Threats to biosecurity. • Greenhouse gases because of population growth in people, animals, etc. • Issuing of landowner carbon credits. • High levels of atmospheric and water pollution in South Africa, acid rain, acid ground water, effluent discharge, pesticides. • Resilience in agriculture production is under threat. • Emerging diseases effects on the environment due to slowdown of social and economic activities. • Compliance to regulatory standards/requirements (e.g. Incinerator).

LEGAL/REGULATORY ANALYSIS

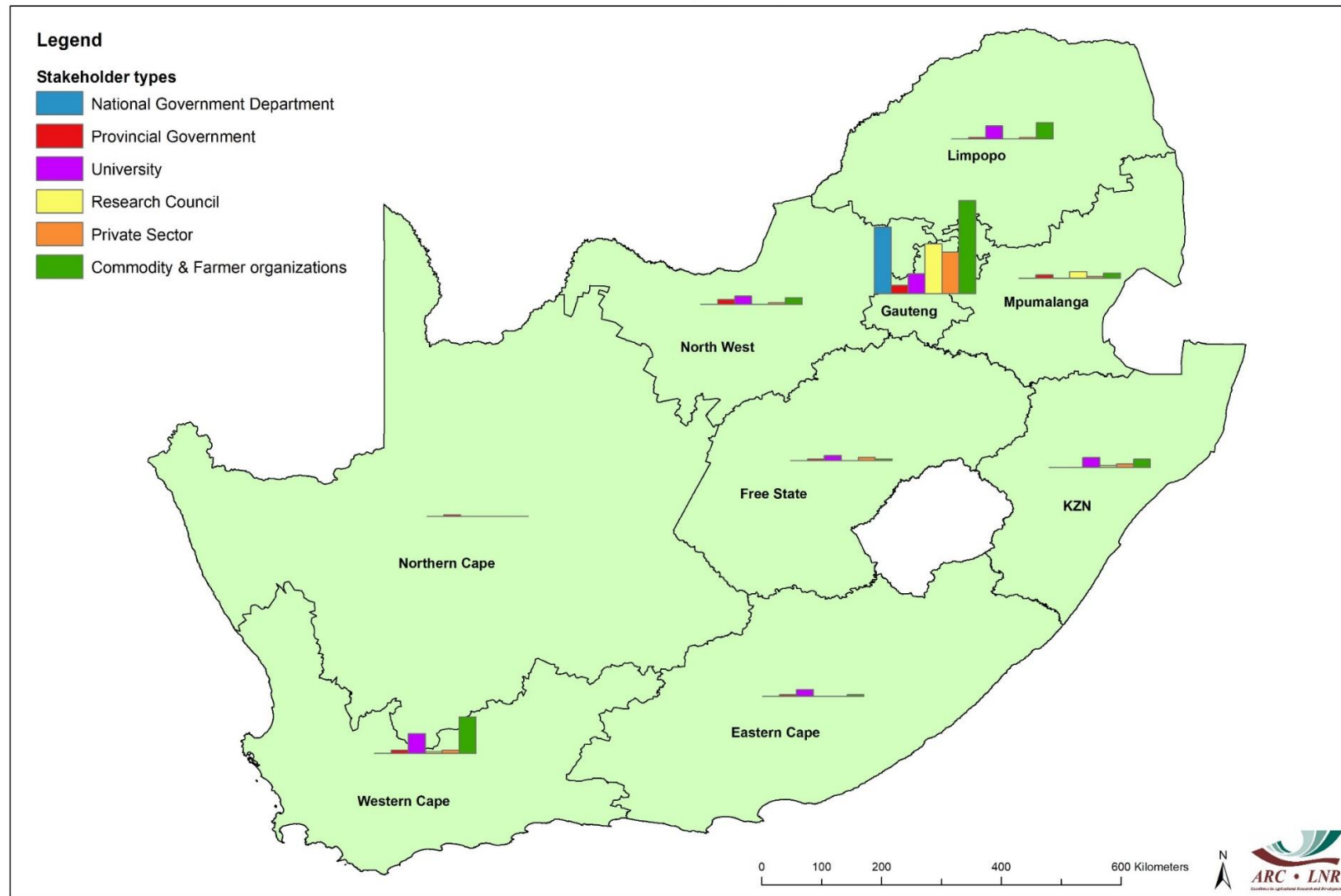
- Changes to legislative mandate.
- Biodiversity regulatory system.
- Regulatory permits system (e.g., GMO Act and release of biological control agents, Cannabis).
- Intellectual property regulations and new national IP policy.
- Phytosanitary and public health (e.g., zoonotic disease) regulations.
- Scientific and technical support for effective regulatory compliance.
- Competition regulation.
- Property rights (immovable) regulations and implications for asset values and for new investment.
- Changes in labour legislation.
- Impacts of other national policies/statutes/treaties (e.g., Medicines Control Act, etc.).
- Impact of PFMA on efficiency, long-term competitiveness, and sustainability of SOEs.
- International trade laws and regulations.
- Impact of the Nagoya Protocol.
- Land reform regulations.
- Lack of regulations in testing and evaluation of agricultural machinery and equipment's. and food products.
- Carbon Tax.
- Water use licences and accounting.
- Distribution of statutory levy from NAMC and its availability for public R&D.
- Compliance to regulatory standards/requirements (e.g. Incinerator, BSL-3)

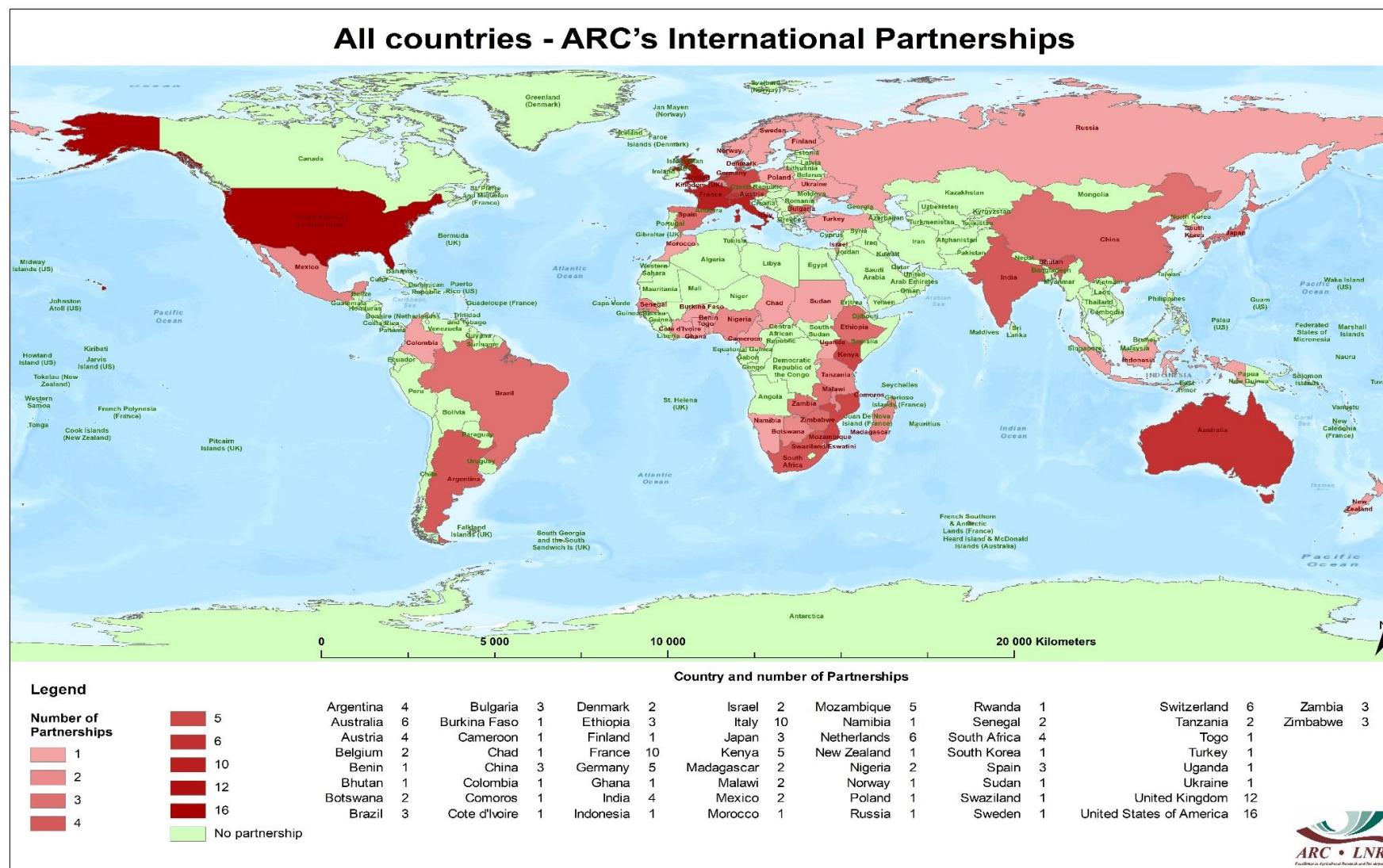
UPDATED STAKEHOLDER ANALYSIS – INFORMING 2023/24 PLANNING

The ARC has a broad range of stakeholders that it interacts with to enable delivery of its mandate. These local and international stakeholders include but are not limited to national and farmers, provincial government departments, commodity associations, funders, Universities, and other research Organisations. The stakeholders benefit from ARC R&D services or enable the ARC to translate its R&D outputs into desired outcomes for long-term impact on sector growth and productivity, poverty alleviation and food security. Understanding the range of stakeholders and the ARC's relationships with these stakeholders is important for strategic decision-making and to enable continuous improvement of these relationships. The stakeholder mapping shows the extent of ARC's reach and visibility in South Africa and beyond.

Opportunities exist for the ARC to increase its footprint on the African continent, both in terms of the number of countries reached as well as the number and types of international partnerships pursued. This is particularly important as the continent works towards implementation of the Africa Continental Free Trade Agreement (AfCFTA) and agriculture has been identified as a sector through which some of the most gains from the free trade area can be realised. Locally, opportunities exist for the ARC to increase partnerships in provinces such as Eastern and Northern Cape and the Free State provinces. As part of its day-to-day business and at strategic levels, the ARC will continue to prioritise stakeholder engagement and management activities.

ARC - Stakeholder types per Province







Physical Address: 1134 Park Street, Hatfield, Pretoria
Postal Address: P.O. Box 8783, Pretoria, 001, SOUTH AFRICA

Reception: +27 (0)12 427 0700
Fax: +27 (0)12 430 5814
Email: Communications@arc.agric.za
Website: www.arc.agric.za

RP: 20/2023
ISBN: 978-0-621-50863-5
Title of Publication: ARC Annual Performance Plan 2023/2024