

AGRICULTURAL RESEARCH COUNCIL

Strategic Plan: 2015/16 – 2019/20

And

Annual Business Plan for 2016/17

OUTLINE OF PRESENTATION

1. ARC Council Members
2. Executive Management Team
3. ARC Mandate, Vision & Mission
4. ARC Alignment to National Priorities and Policies
5. Science and Agriculture Indicators of Economic Performance
6. ARC Review of Organizational Performance
7. Outcome Oriented Strategic Goals (1 to 6):
 - Goal 1
 - Goal 2
 - Goal 3
 - Goal 4
 - Goal 5
 - Goal 6
8. Critical Success Factors

ARC COUNCIL MEMBERS

1. Prof. Sibusiso Vil-Nkomo, Chair
2. Prof. Michael Kahn, Deputy Chair
3. Ms. Joyce Mashiteng, Chair: Finance, Investment and ICT Committee
4. Mr. Gerard Martin, Chair: Human Resources & Remuneration Committee
5. Prof. Frans Swanepoel, Chair: Research and Development & Evaluation Committee
6. Dr. Shadrack Moephuli, CEO
7. Dr. Joyce Chitja
8. Mr. Mzolisi Dyasi
9. Mr. Ismail Motala
10. Mr. Nick Nicholls
11. Dr. Wilna van Rijssen
12. Mr. Alan Bishop
13. Mr. Clive Kneale
14. Prof. Louw Hoffman

ARC EXECUTIVE MANAGEMENT TEAM

1. Dr. Shadrack Moephuli, CEO
2. Mr. Gabriel Maluleke, Chief Financial Officer
3. Dr. Nthabisent Motete, Group Executive: Crop Sciences
4. Ms. Makgomo Umlaw, Group Executive: Human Resources & Legal Services
5. Mr. Frans Monkwe, Group Executive: ICT and Infrastructure
6. Dr. Jasper Rees, Group Executive: Research & Innovation Systems
7. Dr. Andrew Magadlela, Group Executive: Animal Sciences
8. Dr. Litha Magingxa, Group Executive: Agriculture Economics and Capacity Development

MANDATE

The Agricultural Research Council (ARC) is mandated to promote the agricultural and related sectors through:

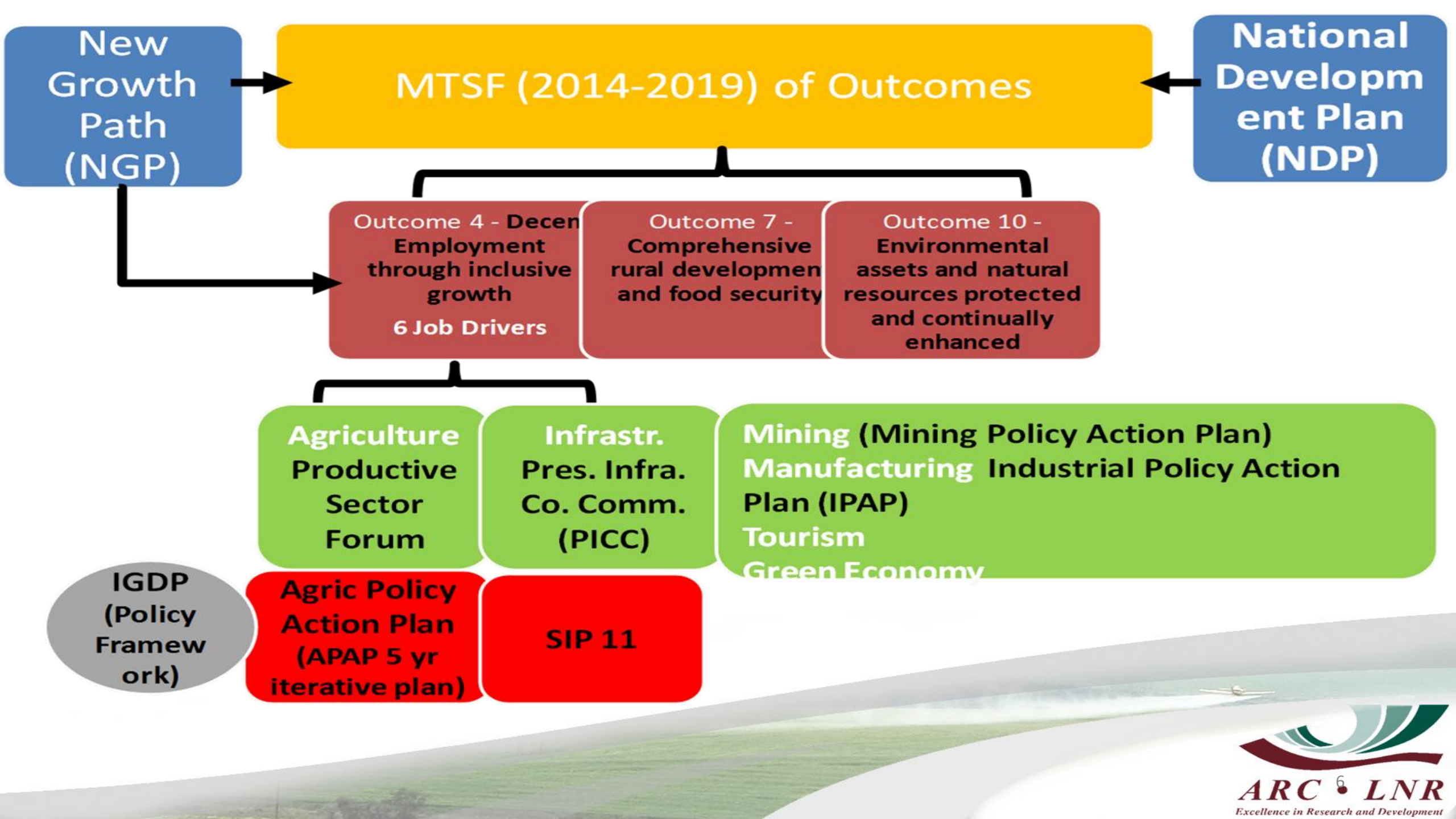
- **Research:** *the furtherance, accumulation and improvement of knowledge in the agricultural and related sciences through original and other investigations and methods of a scientific nature with the advancement of agriculture as its object;*
- **Development:** *as activities by which knowledge acquired through research is utilized; and*
- **Technology Transfer:** *transfer of knowledge, techniques & processes for application thereof.*

VISION

Excellence in agricultural research and development

MISSION

The Agricultural Research Council is a premier science institution that conducts research with partners, develops human capital and fosters innovation to support and develop the agriculture sector.



ARC CONTRIBUTION TO NATIONAL PRIORITIES AND OUTCOMES

1. Supporting objectives of the National Development Plan, Vision 2030 through an ARC business strategy and organization structure aligned to national priorities;
2. Employment and Job creation, particularly among the poor;
3. Food and Nutrition Security for all, particularly within households;
4. Improved productivity, production, competitiveness and sustainability of animal and crop based agriculture;
5. Contributing to bio – security;
6. Optimal technology platforms for agricultural production;
7. Strengthening the role of the bio – economy (the “Farmer to Pharma Value Chain”) to enable South Africa to become a leader in Biotechnology and related pharmaceuticals through our knowledge base;
8. Enabling the country to adapt and respond to climate change impacts (water, land, energy, sustainable natural resource utilization etc.)
9. Contributing to South Africa’s Global and Regional positioning and integration; and,
10. Ensuring an optimal and sustainable organization.

ARC STRATEGIC GOALS (OUTCOMES ORIENTED)

1. To generate knowledge and technologies that will enhance the efficiencies in crop based agriculture;
2. To generate knowledge and technologies that will enhance the efficiencies in animal based agriculture;
3. To generate knowledge and technologies for the conservation and utilization of natural resources;
4. To generate knowledge, solutions and technologies for food safety, quality and improved efficiencies in the agriculture value chain;
5. Translate research outputs in order to generate knowledge, facilitate decision making and contribute to the transformation in the agriculture sector; and,
6. Apply resource management practices towards a high performing and visible organization.

ARC SCIENCE & ROLE IN AGRICULTURE ECONOMY

SCIENCE COUNCIL

- Innovation in science
- Basic/fundamental research
- Applied research (technologies)
- Intellectual assets
- Skilled scientists & engineers
- Volume & quality publications
- Scientist ratings
- Number of PhDs
- Number of doctoral fellows
- Number of postdoc fellows
- Scientific awards

AGRIC. DEVELOPMENT

- Economic link to Innovation
- Applied research
- Technology Transfer/dissemination
- Intellectual Asset Use
- Agricultural Production & productivity
- Food Security – hunger
- Environmental Sustainability
- Import Substitution
- Export Promotion
- Agrarian Transformation
- New products (vaccines, cultivars etc.)

Strategic Goal 1

To generate knowledge and technologies that will enhance the efficiencies in crop based agriculture

- **Crop production for broadening of the food base, ensuring food and nutritional security and welfare**
- Optimised crop production systems to mitigate agricultural risks in the changing environment
- Crop science research and development for improved cultivars of food and non-food crops (breeding, genetics and physiology)
- Enhanced crop protection systems
- Development and transfer of appropriate technologies to smallholder farmers for sustainable production systems
- Characterising and evaluating crops in terms of quality, nutritional composition, shelf life and suitability for processing
- Improvement of agricultural production and profitability through adaptive and innovative crop management and production systems such as conservation agriculture
- Lowering input costs
- Crop cultivar development through genetic improvement and modification
- Disease and pest control by means of enhanced genetic diversity, Bio-control and strategies for management of alien invaders
- Training of crop growers and extension staff to ensure sustainable production
- Provision of scientific services to farmers and other clients of ARC

WATER EFFICIENT MAIZE FOR AFRICA (WEMA)(droughtTEGO)

- ARC is working with Jermart Seeds and Capstone Seeds to market WE3127 and WE3128 hybrids in RSA, and to this end, **Capstone** committed to produce **50 tonnes** of Certified seed and **Jermart** committed to produce **80 t** of Certified seed to meet demands of small holder farmers for the 2016/17 summer planting season.
- Continued engagements with farmers in rural communities to promote WEMA varieties and to document impact analysis of WEMA products. Drought tolerant WEMA varieties are on very high demand among due to good yields and farmer's days events of 2015 were well attended. More farmer's days are planned for 2016 to include all provinces affected by drought.
- Recorded yields for from WEMA varieties in Mokopane (Limpopo) among 9 Small Holder Farmers were 1.14 t/ha compared to 0.6 t/ha from other varieties. In Mooifontein (North West) where rainfall was as low as 250 mm rainfall, farmers achieved record yields of 2 t/ha with WEMA compared to 1.5 t/ha with other varieties.

Site	Number of Female participants	Number of Male participants	TOTAL
Madikwe (NW) – 19 March	55	27	82
Mooifontein (NW) – 19 May	23	55	78
Polokwane (L) – 27 May	150	150	300
Hamakuya (L) – 29 May	57	40	97
Mooifontein (NW) – 26 June	23	12	35
Mokopane (L) – 22 July	35	30	65
QwaQwa (FS) – 24 July	90	58	148
TOTALS	433	372	805

SMALLHOLDER FARMERS EXPERIENCES OF PLANTING DROUGHTEGO in 2014/15

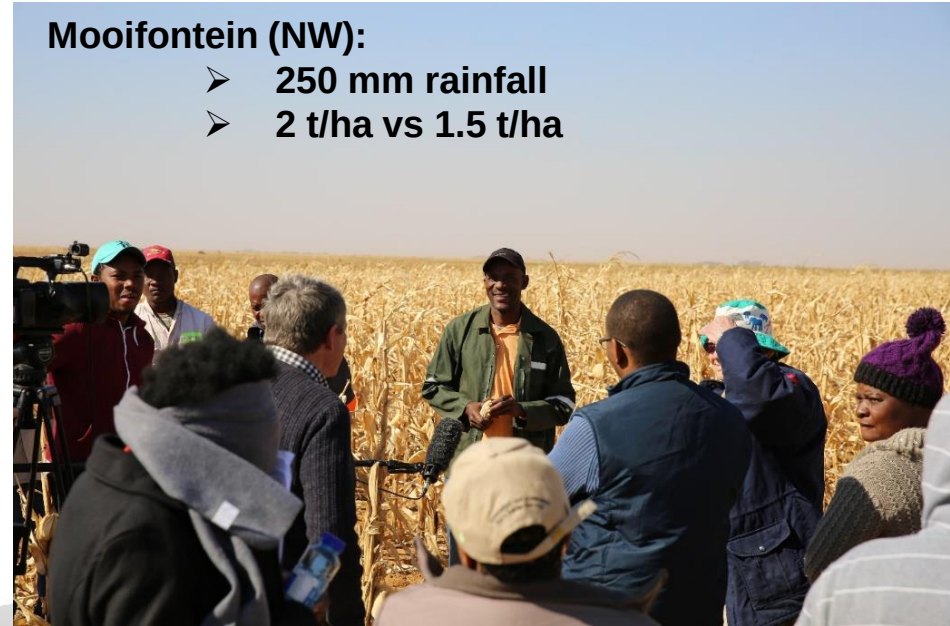
- ARC (Agricultural Research Council) distributed 10 000 seed packs, 500 grams each, free to smallholders in Limpopo, Mpumalanga, North West, State and KwaZulu-Natal for them to try out the variety. According to Isaiah Setseta, chairman of the Mokaba Farmers' Association, their yield was 1.14t/ha compared to 0.6t/ha the previous season, with good rains – 100% increase in a season that has been termed the worst in two decades. They only had rain immediately after planting and again during flowering. At Mooifontein, near Lichtenburg, North West, according to Prince Molema, one of four smallholders who planted the drought tolerant maize, their average yield was 2t/ha compared to 1.5t/ha for other commercial hybrids. Average rainfall during the season was 250 mm compared to an average 500 mm in a normal year.

Mokopane (Limpopo): 9 Small Holder Farmers
Yield was 1.14 t/ha from 0.6 t/ha



Mooifontein (NW):

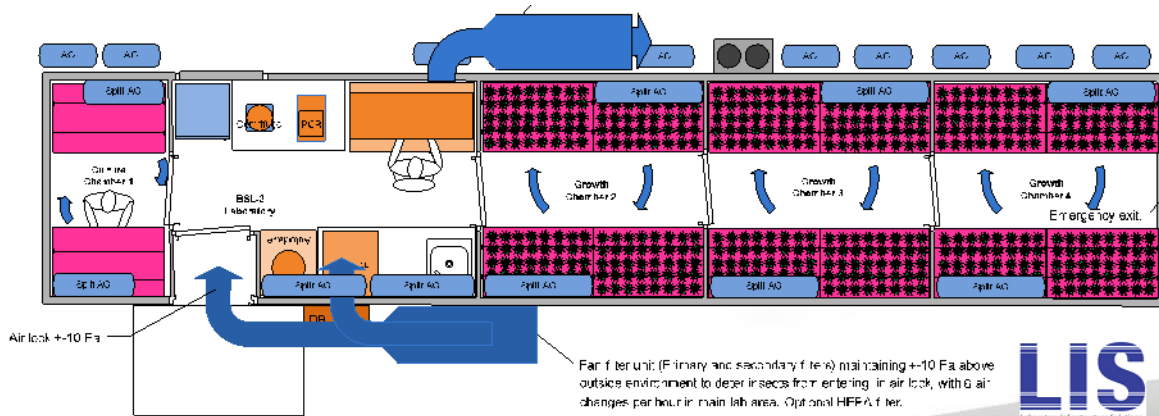
- 250 mm rainfall
- 2 t/ha vs 1.5 t/ha



Plant Growth Facility

Controlled and Contained Environment

- LED lights; temperature, humidity, CO2 all controlled independently in 3 growth compartments
- GMO and pathogen containment to BSL3 level facility
- Completely designed and built locally by ARC and local engineering firm (LIS)



LIS
Laboratory Infrastructure Solutions

Plant Phenomics Platform

- National Research Foundation and ARC – PG Funded
- For high throughput plant imaging for breeding, disease and stress studies
- For implementation in 2016-18



Strategic Goal 2

To generate knowledge and technologies that will enhance the efficiencies in animal based agriculture

FOCUS OF GOAL:

- a) Development of Animal Vaccines
- b) Development of Diagnostic and Analytical Technologies
- c) Improvement to Veterinary Public Health
- d) Development of Disease Control Strategies
- e) Development and Introduction of new traits and genetic diversity in animals
- f) Enhance animal production and nutrition technologies
- g) Animal, crop and mixed production systems developed and transferred to smallholder farmers
- h) Animals and mixed production systems developed for smallholder farmers

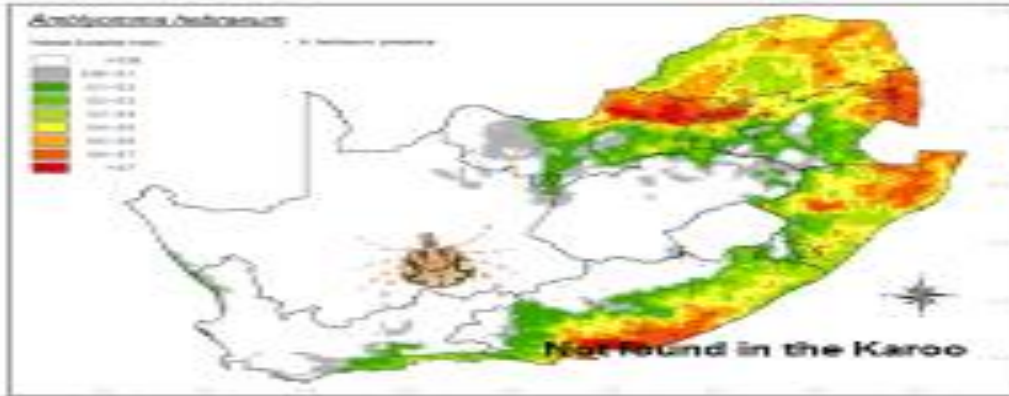
OUTCOMES WITH ASSOCIATED IMPACT:

- a) High quality improved meat and dairy products that are safe, highly nutritional with visual appeal;
- b) Disease free herds (livestock & wildlife);
- c) Reduced degradation of rangelands;
- d) Improved livestock production through adoption of improved rangeland management
- e) Effective animal breeding methods/techniques
- f) Increased efficiency of livestock production from breeding
- g) Improved livelihoods among smallholder farmers
- h) Reduced number of stock theft incidents
- i) Disease and residue free animal products for increased market access

Strategic Goal 2

To generate knowledge and technologies that will enhance the efficiencies in animal based agriculture

Tick distribution in South Africa



Livestock at Risk
35% of 15 m. Cattle
55% of 6,5 m. Sheep
20% of 25 m. Goats

To counter this problem the ARC has developed a new attenuated heartwater vaccine!!

Heartwater disease

- Farmers control the disease by the use of antibiotics to treat or block-treat the herd to induce prophylaxis. This method is expensive, prone to drug-abuse, does not work in many situations depending on timing of infection & treatment (immunity) and increases the risk of development of antibiotic resistance
- The majority of farmers rely on tick control using acaricides. This is also expensive, results in acaricide resistance in ticks
- Both control methods are thus, **not effective and unsustainable**



ANIMAL DISEASE MORTALITY AFFECT LIVELIHOODS

1. Heartwater is a tick – borne disease of ruminant animals caused intracellular bacteria, Ehrlichia ruminantium
2. Economic losses in Sub – Saharan Africa are estimated R975 million per annum, costs to South African farmers (commercial and emerging sector) estimated at R220 million annually, which will be saved when the vaccine is available commercially.
3. The production of mohair (the hair of the Angora goat; the most susceptible animal to the disease) in 2013 was approximately 2.3-million kilograms of the fibre, which is highly sought after in the world's fashion capitals in Europe and increasingly in China. The availability of a HW vaccine will boost mohair production as Angora goats are the most susceptible.
4. Farming with Angora goats is considered the most profitable livestock farming operation in South Africa.
5. FACT: Last year's production of mohair in South Africa earned local farmers about R250m and the exported product earned almost R800m.
6. The mohair industry, is mostly based in the Eastern Cape, and provides about 6,000 jobs, about 30,000 dependants, 1,000 commercial farmers and a fast-growing sector of smallholder farmers.
7. Losses in cattle, sheep and others goat breeds combined also run into the millions. Development of new vaccine will play vital role in expanding the number of successful livestock farmers resulting in reduced losses and increase in revenue for the farmers.

ARC DEVELOPED AN ATTENUATED HEARTWATER VACCINE

ADVANTAGES:

1. Broad spectrum: attenuated vaccines activate all phases of the host immune systems
2. Produce durable immunity (6 months-lifelong).
3. No live animals are used for production
4. They are cheaper to produce
5. Treatment with antibiotics is not necessary after vaccination
6. Do not revert back to virulence
7. Production in a closed in vitro culture system minimizes the risk of introducing extraneous biological contaminants.

ARC ENABLING ACCESS OF THE HEARTWATER VACCINE FOR ALL FARMERS

NEXT STEPS FOR MASS PRODUCTION & MARKETING:

1. Collaborate with OBP to develop product safety, production and packaging information for successful registration of vaccine with government
 2. Vaccine Registration
 3. ARC product licensing to OBP or other manufacturer/s
 4. Scientific and Technical information exchange with OBP (Technology Transfer)
 5. Commercial Production of approved doses by OBP & product marketing
- Vaccine estimated to be on the market 12 to 24 months

Kaonafatso ya Dikgomo (Animal Improvement Scheme)

- Major achievement in the 2015/2016 FY – Exceeded a milestone of 8000 smallholder livestock farmers receiving ARC scientific services



- Expected Impact:
 - A viable and sustainable commercial smallholder livestock sector
 - Better rural livelihoods from livestock-based agriculture
 - More productive smallholder livestock sector

Key Deliverables for Kaonafatso ya Dikgomo (Animal Improvement Scheme)

- Provide access to scientific analysis with services in the form of advisory services on:
 - Animal husbandry principles
 - Breeding and reproduction
 - Nutrition
 - Animal health
 - Rangeland management
- Facilitate market access for smallholder farmers
- Registration of farmers on the national animal database Integrated Registration and Genetic Information System (INTERGIS)
- Process (quantitative and qualitative genetic information) performance data and generate reports to assist farmers with selection and breeding decisions

Improving the gene pool in the smallholder beef sector

1. ARC has partnered with the IDC in the project to improve the quality of breeding stock in the smallholder holder beef sector
2. The role of the ARC in this project is to breed high quality bulls and make them available to The IDC for distribution to smallholder farmers
 - The ARC currently owns genetically superior Nguni and Bonsmara stud herds in Loskop and Roodeplaat respectively
 - The herds have a good history of producing breeding stock that is sought after by the industry
3. The potential benefits and impacts of the project are:
 - Improved access to good bulls by smallholder farmers particularly communal farmers
 - High quality breeding stock that would lead to improved production efficiency
 - Restoration of genetic diversity among the cattle owned by smallholder farmers through prevention of indiscriminate crossbreeding

Facilitating Market Access for smallholder livestock farmers

1. A 3-year project funded by ARC and the Australian Center for International Agricultural Research (ACIAR)
2. The project officially commenced in 2015
3. The aim of the project is to establish high quality markets and value chains for smallholder beef farmers in South Africa

➤ Project partners include:

**NATIONAL DEPARTMENT
OF AGRICULTURE**

**DEPARTMENTS OF
AGRICULTURE IN:**

- **EASTERN CAPE**
- **FREE STATE**
- **GAUTENG**
- **KWA-ZULU NATAL**
- **LIMPOPO**
- **MPUMALANGA**
- **NORTHERN CAPE &**
- **NORTH-WEST PROVINCES**



- A value chain for the Woolworths free range beef is being established in Cradock, EC

ARC and DRDLR – Dairy Value Chain Project

1. The project aims to develop dairy value chain in rural communities of the Eastern Cape and Limpopo Provinces in order to stimulate rural economy
2. Project is implemented in the following areas:
 - EC:
 - Alfred Nzo : Mbhizana : Mngungu Village
 - OR Tambo: Butterworth : Bethel College: Butterworth
 - LP:
 - Sekhukhune : Makuduthamaga : Mokwete, Vergelegen, GaMolepane -Ward 11 & 9
 - Vhembe: Makhado: Njhakanjaka –Ward 8
3. Expected Outcome/s include:
 - Employment creation for graduate students and dairy entrepreneurs in the DVC
 - Income generation from milk sales, improved food and protein nutrition for community,
 - Diversification of cropping system to fodder production, soil fertility improvement through dairy manure nutrient re-cycling
 - Opportunity for other business, human capacity development through training, contribution to national milk production from smallholder sector

Strategic Goal 3

To generate knowledge and technologies for the conservation and utilization of natural resources

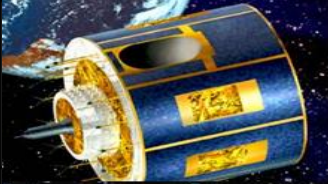
FOCUS OF GOAL:

- a) Alternative energy technologies
- b) New and improved conservation agriculture systems
- c) Climate Smart agriculture to enable mitigation and adaptation to climate change
- d) Improved water management and irrigation practices
- e) Natural resources monitored and characterised
- f) Genetic resources, databases updated and maintained
- g) Green technologies and processes to mitigate impact of agriculture on the environment
- h) Enhanced mechanization in agriculture
- i) Agriculture engineering

OUTCOMES WITH ASSOCIATED IMPACT:

- a) Climate smart agriculture technologies adopted & utilized that sustainably increase agricultural productivity and incomes;
- b) Increased resilience of Agriculture to climate change;
- c) Reduced greenhouse gas emissions;
- d) Optimal agricultural production from increased biodiversity
- e) Water efficient agriculture
- f) Energy efficient agriculture
- g) Optimal utilization of land for sustainable agriculture
- h) Appropriate infrastructure for increased, efficient and sustainable agriculture

Remote Sensing Systems

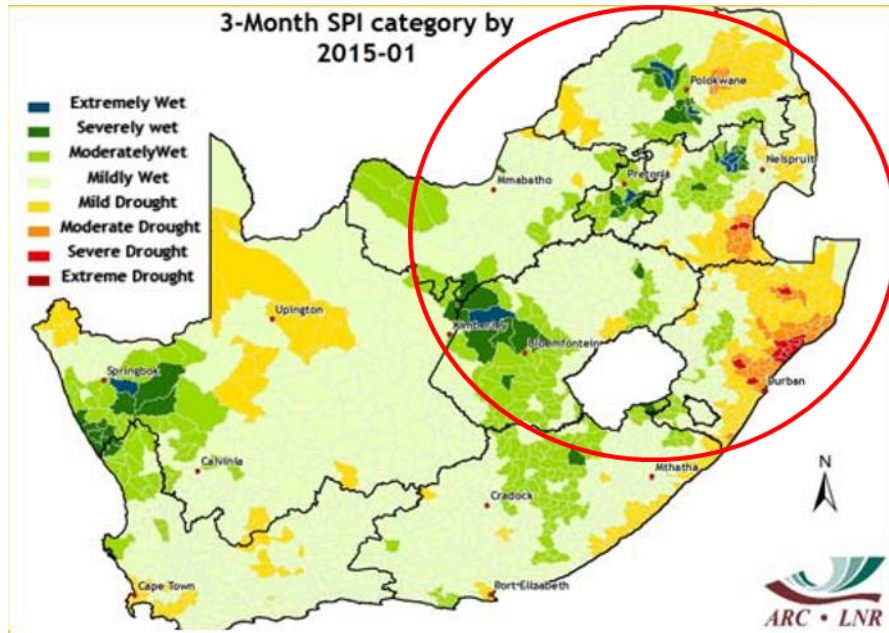
Platform	Distance	Scale	Resolution	EMS spectrum
	36 000 km	Global Continental National	1 - 5 Km	VIS / IR / Thermal
	600 km	Provincial District Farm Big Field	1 - 250 m	VIS / IR / Thermal / RADAR Hyperspectral
	1 – 10 km	District Farm Field	20 cm – 5 m	VIS / IR / Thermal / Hyperspectral LIDAR / Gas
	50-1000 m	Farm Field	10 cm – 2.5 m	VIS / IR / Thermal / Hyperspectral LIDAR / Gas
	10 -500 m	Field Plot	5 cm – 2 m	VIS / IR / Thermal / Hyperspectral LIDAR / Gas
	1cm -10 m	Plot Plant	5 mm – 5 m	VIS / IR / Thermal / Hyperspectral LIDAR / Gas

Remote sensing/imaging and near-range sensing systems - by 2030

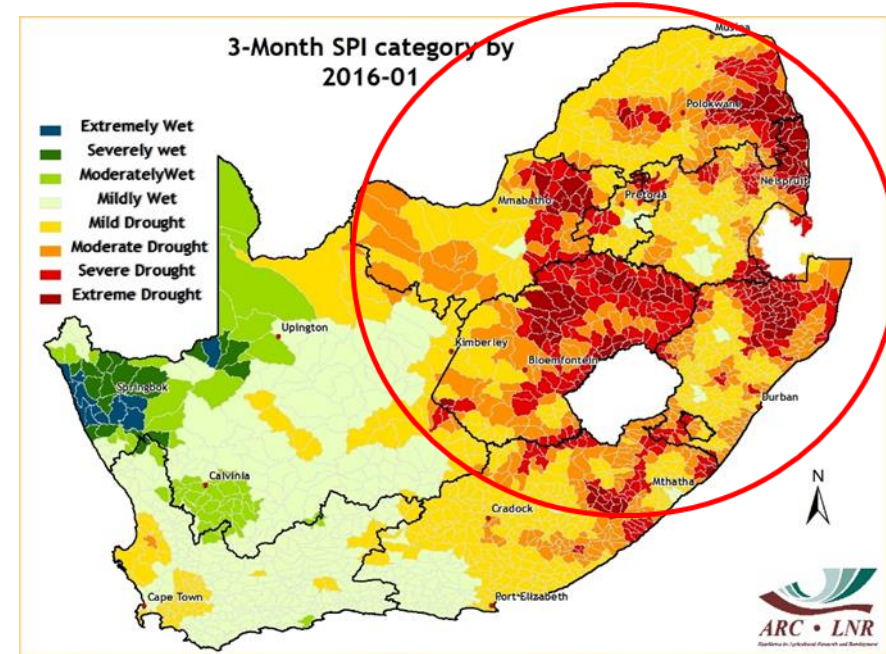
- Applications in research and production environments for decision making (e.g. Land use mapping and management etc.)
- Complete range of technologies for sensing and detection
- Integration of data from different systems
- Delivery of analysed and interpreted data back to farmers at field level to mobile devices in near-real time
- Full integration of sensing systems for plant and animal phenomics

UMLINDI NEWSLETTER

January 2015



January 2016



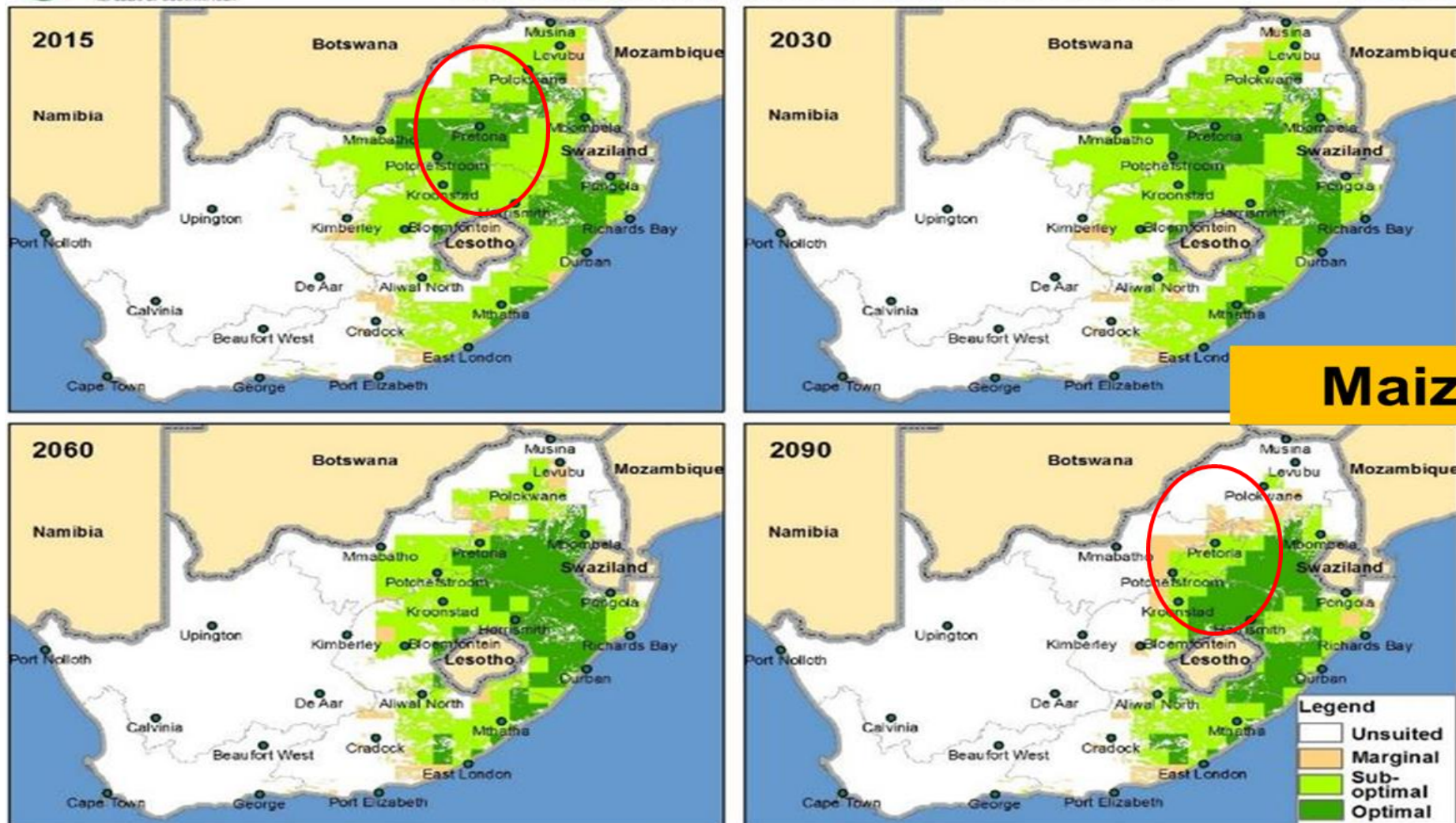
The above figures show that the current season (January 2016) is drier than the previous season (January 2015). The current situation is a result of El Nino, which restricted rainfall in most parts of the country last year. The figure of January 2016 indicates the degree of soil moisture deficit, which made planting impossible during the planting season.

Information about drought conditions has been communicated by the ARC to stakeholders including farmers.

Potential impacts of projected climate change on occurrence of droughts and production potential

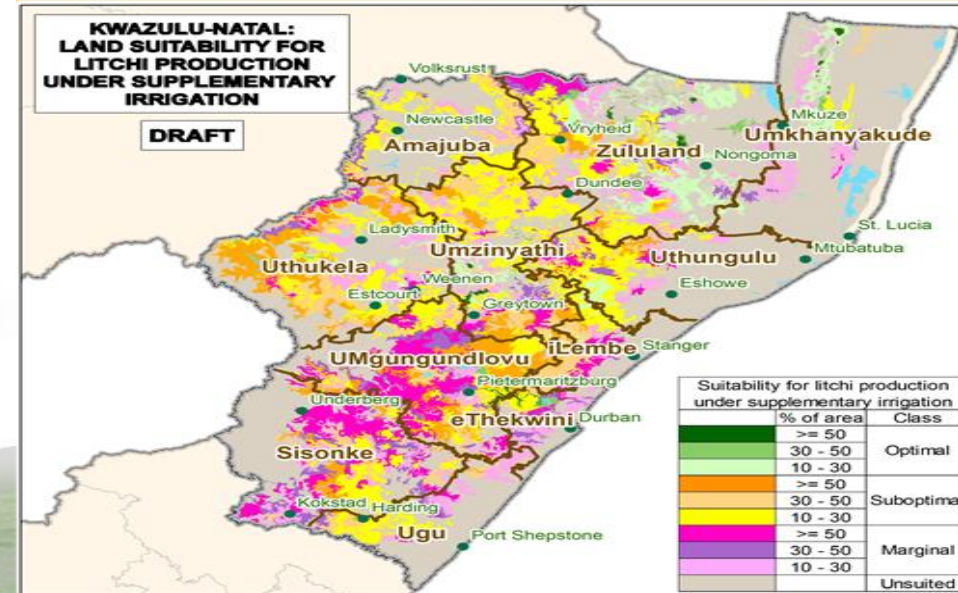
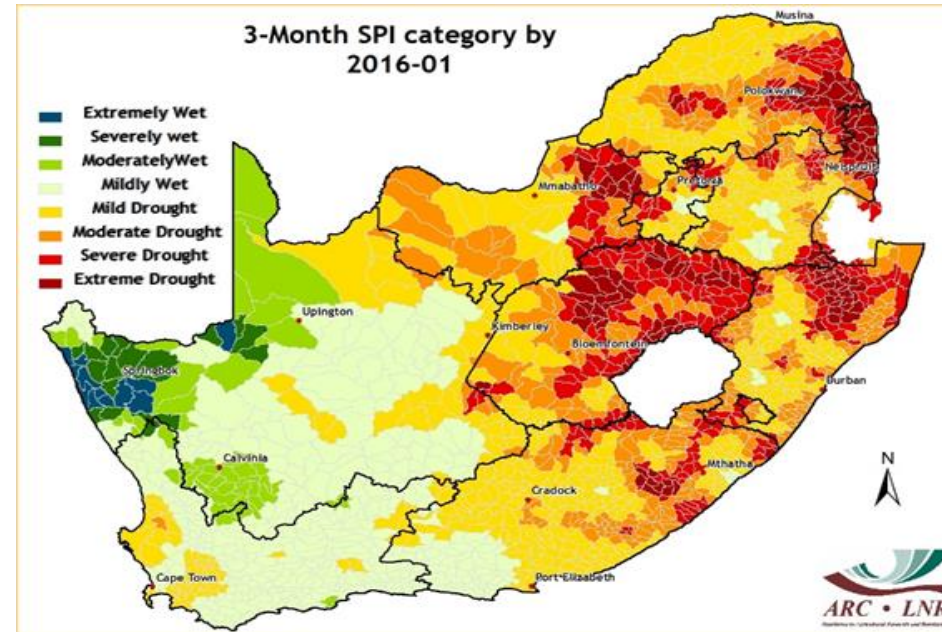
Suitability for rainfed maize (long/medium growing period)

Criteria: rainfall, minimum temperature, maximum temperature and soil
Median of six climate projections for 2015, 2030, 2060 and 2090



RESEARCH ON CLIMATE CHANGE FOR AGRICULTURE RESILIENCE

- Modeling and Forecast data for farmers in the context of El Nino and 2015-16 Drought
- Future modeling for crop suitability studies and land use prediction
- Modeling for water use management



Strategic Goal 4

To generate knowledge, solutions and technologies for food safety, quality and improved efficiencies in the agriculture value chain

FOCUS OF GOAL:

- a) New food and non-food processes and products developed
- b) Improved quality and yield through developments in food sciences and technologies
- c) Reduced post – harvest losses
- d) Improved shelf life of agricultural products and food
- e) New animal products developed

OUTCOMES WITH ASSOCIATED IMPACT:

- a) Increased number of new food and non – food products and processes
- b) Improved quality and safety of food through agro – processing
- c) Improved quality and yield through developments in food sciences and technologies
- d) Tools for animal and plant disease studies
- e) Knowledge and information for decision support systems.

Strategic Goal 5

Translate research outputs in order to generate knowledge, facilitate decision making and contribute to the transformation in the agriculture sector

FOCUS OF GOAL:

- a) ARC technologies packaged and exploited
- b) Established and functional agri – incubators
- c) Animal, crop and mixed production systems transferred to smallholder farmers
- d) Agriculture Development Centres that are delivering services. ARC footprint and visibility enhanced
- e) Smallholder farmer enterprises support
- f) Agricultural skills and capacity developed
- g) Agriculture research for development outcomes communicated and disseminated
- h) Marketing and stakeholder management

OUTCOMES WITH ASSOCIATED IMPACT:

- a) Increased adoption and use of ARC technologies among smallholder farmers
- b) Increased number of animal, crop and mixed production systems transferred to smallholder farmers
- c) Increased skills base and capacity in agriculture sector
- d) Increased use of and application of agriculture science and technology in decision making
- e) Improved image and relations of ARC with stakeholders

Key achievements towards Strategic Goal 5

- More than 10 000 Smallholder Farmers trained in various provinces of South Africa.
- 1600 Extension Personnel trained, including Animal Health Technicians.
- 9000 Scientific Services rendered to smallholder farmers (Animal Diagnostics, Livestock Improvement, Soil & Water Analysis, Plant Health)
- 32 Scientific demonstration sites established (13 Dipping Facilities, 14 On-Farm Trials; 2 Crush-pens, 1 Auction Facility)
- Strong partnerships were forged with Provincial Departments, Municipalities and Traditional Leaders of Agriculture and Rural Development in various provinces.

IMPACT OF INVESTMENTS IN AGRICULTURE RESEARCH

Return on investment established for research programmes on:

- peaches and nectarines and
- plums

Return on investment



Genetic and Economic Impacts of the National Dry bean Breeding Programme established

- ARC-GCI's dry bean varieties contributed about 11.65 kg of dry bean output per hectare per year between 1972-2014
- Value of yield benefits is about R31.8 million (in 2014 currency values) per year
- Area planted ARC varieties increased from 4.6 % in 1992 to 35.9% in 2014
- Rate of return - 8.92 % per year



Strategic Goal 6

Apply Resource Management Practices, towards a high performing and visible organization

FOCUS OF THE GOAL:

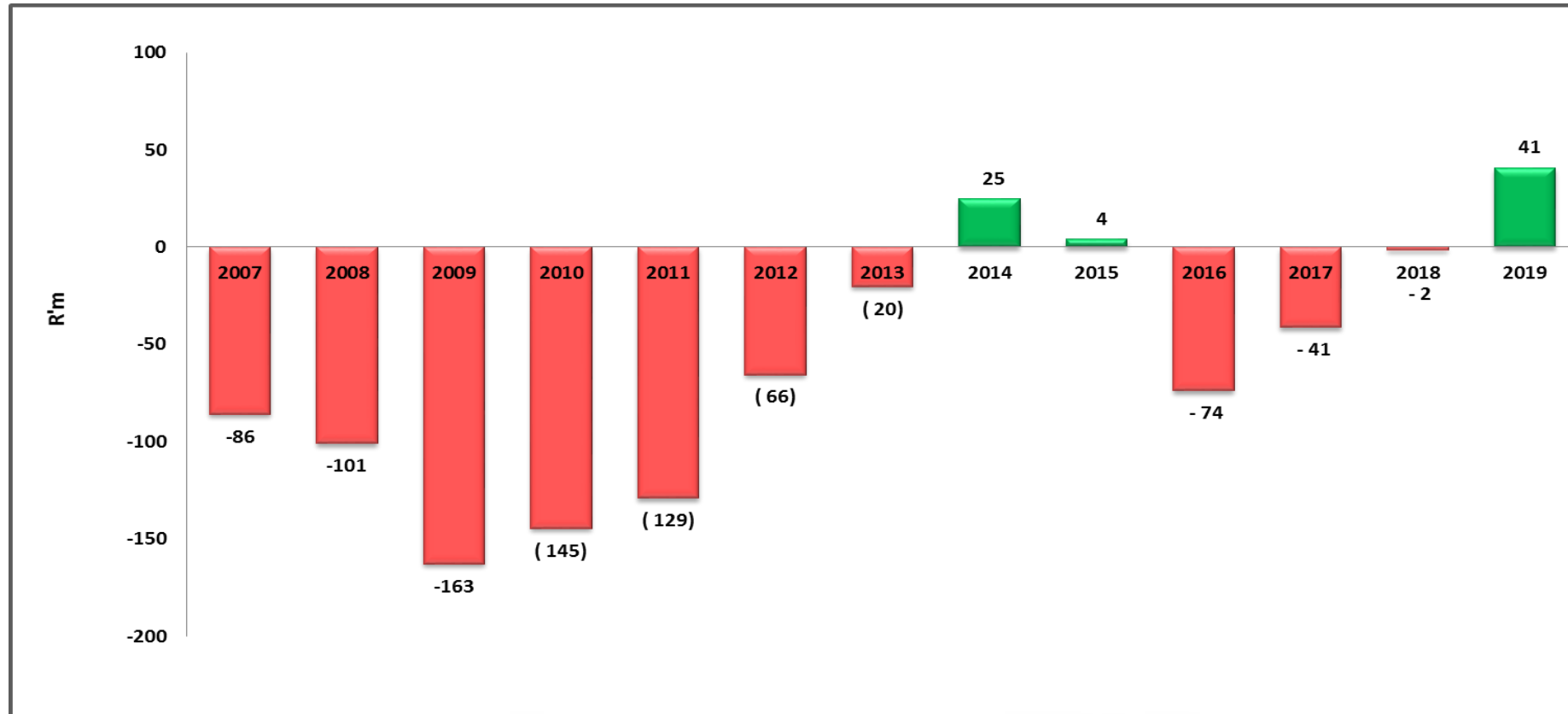
- **Funding revenue and cost management**
- **Asset optimization and control**
- **Sound Corporate Governance**
- **Compliance, risk and audit**
- **Skills and Capacity Development**
- **Provision and Control of various tools of trade**
- **Human Resource policies, procedures and systems**
- **Corporate legal and business support services**
- **Information Communication Technology**
- **Ensuring optimal visibility of ARC**



FINANCIAL PERFORMANCE



Background to ARC Financial Management



Budget Assumptions

- a) Parliamentary Grant cuts R194m for 2015/16-2016/17
- b) Salary increases 6% - Estimate
- c) Projected electricity increase 9.4%
- d) Reduction rural development projects
- e) External income remains flat
- f) No allocation for the completion of the FMD facility



ARC Financial Position (MTEF) 2015/16 – 2018/19

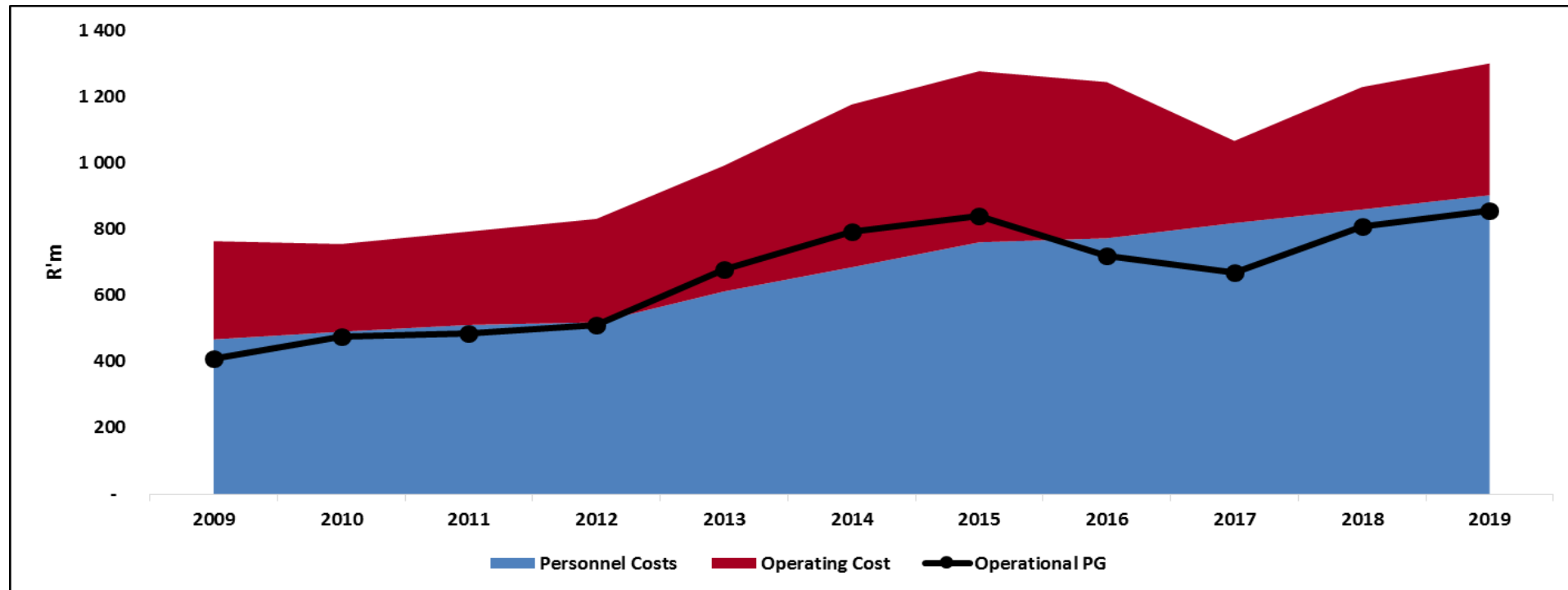
Financial Performance	2016 Forecast R'm	Var. %	2017 Budget R'm	Var. %	2018 Budget R'm	Var. %	2019 Budget R'm
Parliamentary Grant (PG)	801	(6%)	755	19%	898	6%	950
PG - Operational	662	1%	668	21%	807	6%	854
PG - ECSP	57	(100%)	-				
PG - CAPEX	83	5%	87	5%	91	5%	96
External Income	410	0%	410	6%	434	6%	461
Other Income	52	(47%)	27	2%	28	2%	29
Total Revenue	1 264	(6%)	1 192	14%	1 361	6%	1 439
Expenditure	1 283	(14%)	1 103	15%	1 268	6%	1 341
Personnel Costs	772	6%	818	5%	859	5%	902
Operating Expenditure	471	(47%)	248	49%	369	8%	398
Depreciation & Impairment	39	(5%)	37	5%	39	5%	41
Net Surplus\ (Deficit)	(19)	(564%)	89	5%	93	5%	98

ARC Balance Sheet and Cash Flow 2015/16 – 2018/19

Balance Sheet	2016 Forecast R'm	Var. %	2017 Budget R'm	Var. %	2018 Budget R'm	Var. %	2019 Budget R'm
Property, plant and equipment	1 001	10%	1 104	5%	1 156	5%	1 210
Investments	5	0%	5	0%	5	0%	5
Current assets (excluding cash)	155	(24%)	119	11%	132	(8%)	120
Cash resources (net of bank overdraft)	384	(26%)	286	26%	361	3%	372
Total Assets	1 545	(2%)	1 514	9%	1 654	3%	1 708
Capital and Reserves	982	9%	1 071	9%	1 164	8%	1 262
Non Current Liabilities	193	0%	193	0%	193	0%	193
Current Liabilities	371	(32%)	253	19%	301	(14%)	259
Total Equity and Liabilities	1 545	(2%)	1 516	9%	1 658	3%	1 714

Cash Flow	2016 Forecast R'm	Var. %	2017 Budget R'm	Var. %	2018 Budget R'm	Var. %	2019 Budget R'm
Net cash flow from operating activities	(39)	(71%)	(11)	(1 595%)	166	(36%)	107
Net cash flow from investing activities	(86)	4%	(89)	5%	(93)	5%	(98)
Cash and cash equivalents at beginning of year	508	(24%)	384	(26%)	284	26%	357
Cash and cash equivalents at end of year	384	(26%)	284	26%	357	3%	365

Operational Expenditure vs Operational PG (2008/09 – 2018/19)



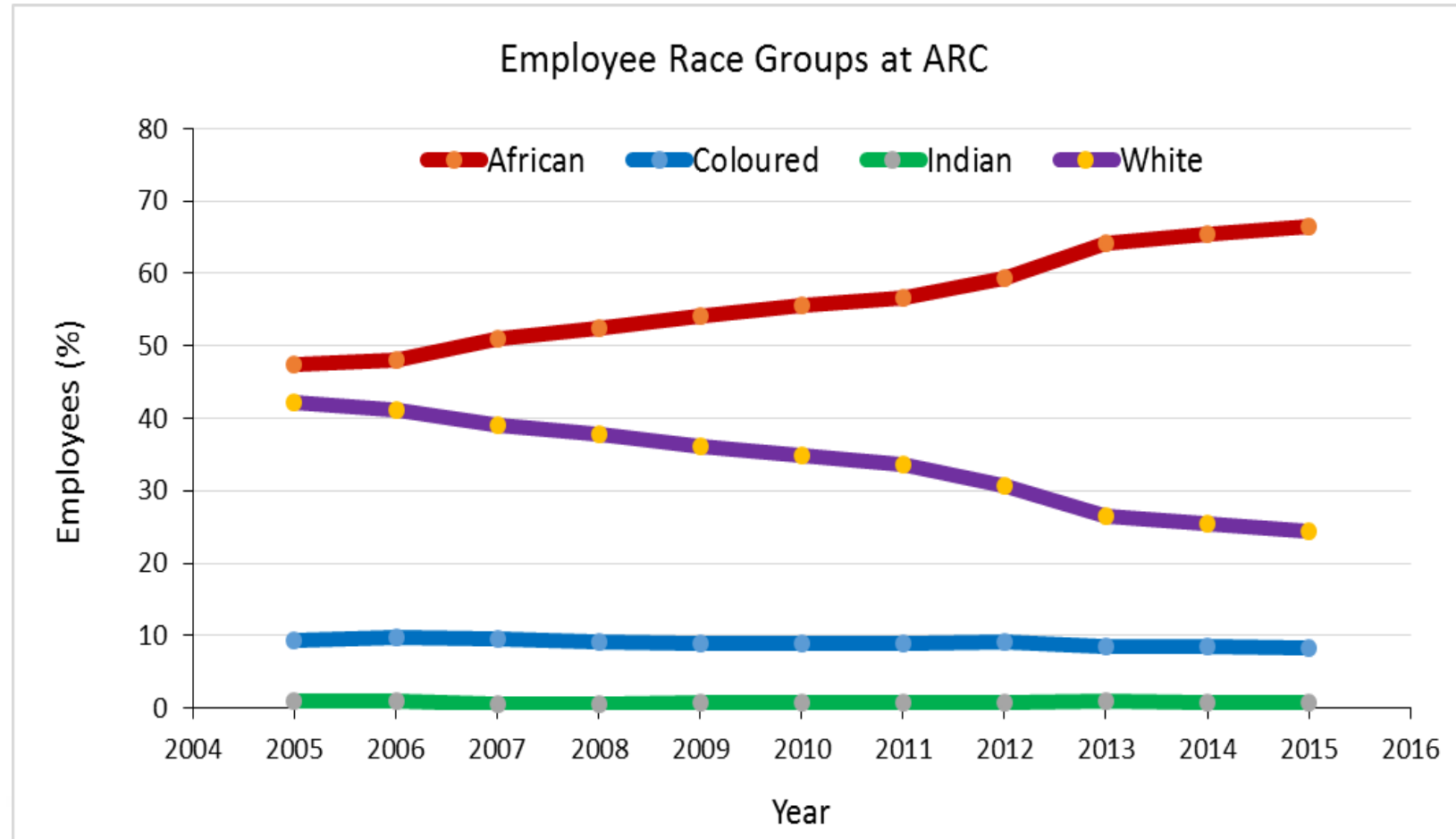
IMPLICATIONS OF BUDGET CUTS ON ARC OPERATIONS

- a) Return to negative cash position over MTEF
- b) Inability to fill critical vacancies – risks to biosecurity
- c) Student intake will be limited- capacity building
- d) Vaccine development projects negatively affected – inability to produce FMD vaccine
- e) No funds available for scaling up technology dissemination
- f) Multiyear projects negatively affected

HUMAN RESOURCES: ARC DEMOGRAPHICS 2005 – 2015

PERCENTAGES PER YEAR

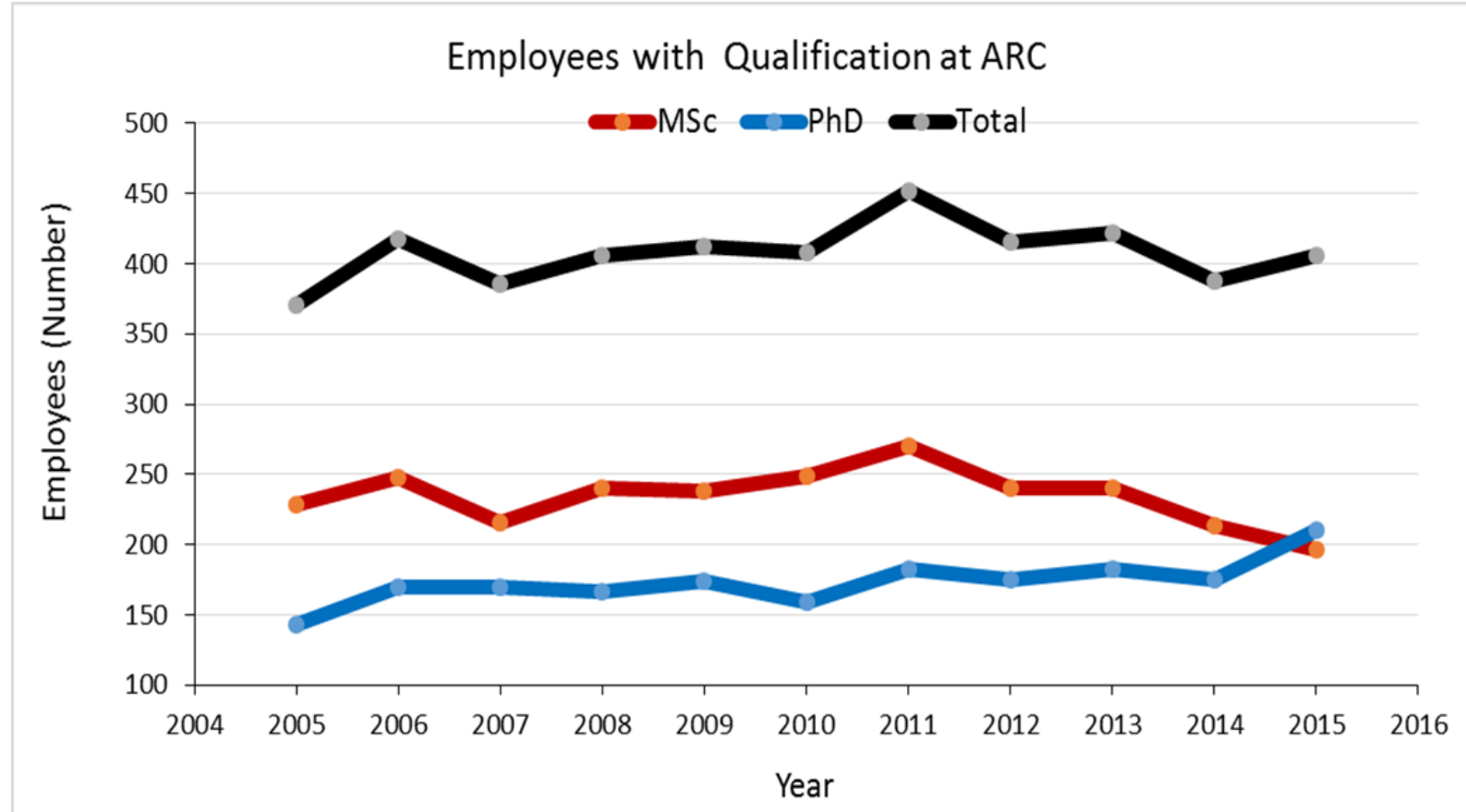
Year	African	Coloured	Indian	White
2005	47.5	9.3	1.0	42.3
2006	48.2	9.7	1.0	41.1
2007	50.9	9.5	0.6	39.0
2008	52.5	9.1	0.7	37.7
2009	54.2	8.9	0.7	36.2
2010	55.5	8.9	0.7	34.9
2011	56.6	8.9	0.8	33.7
2012	59.5	9.1	0.7	30.7
2013	64.1	8.4	0.9	26.6
2014	65.4	8.5	0.7	25.4
2015	66.6	8.3	0.7	24.4



TRENDS IN RESEARCH EMPLOYEE QUALIFICATIONS

NUMBER OF EMPLOYEES PER YEAR

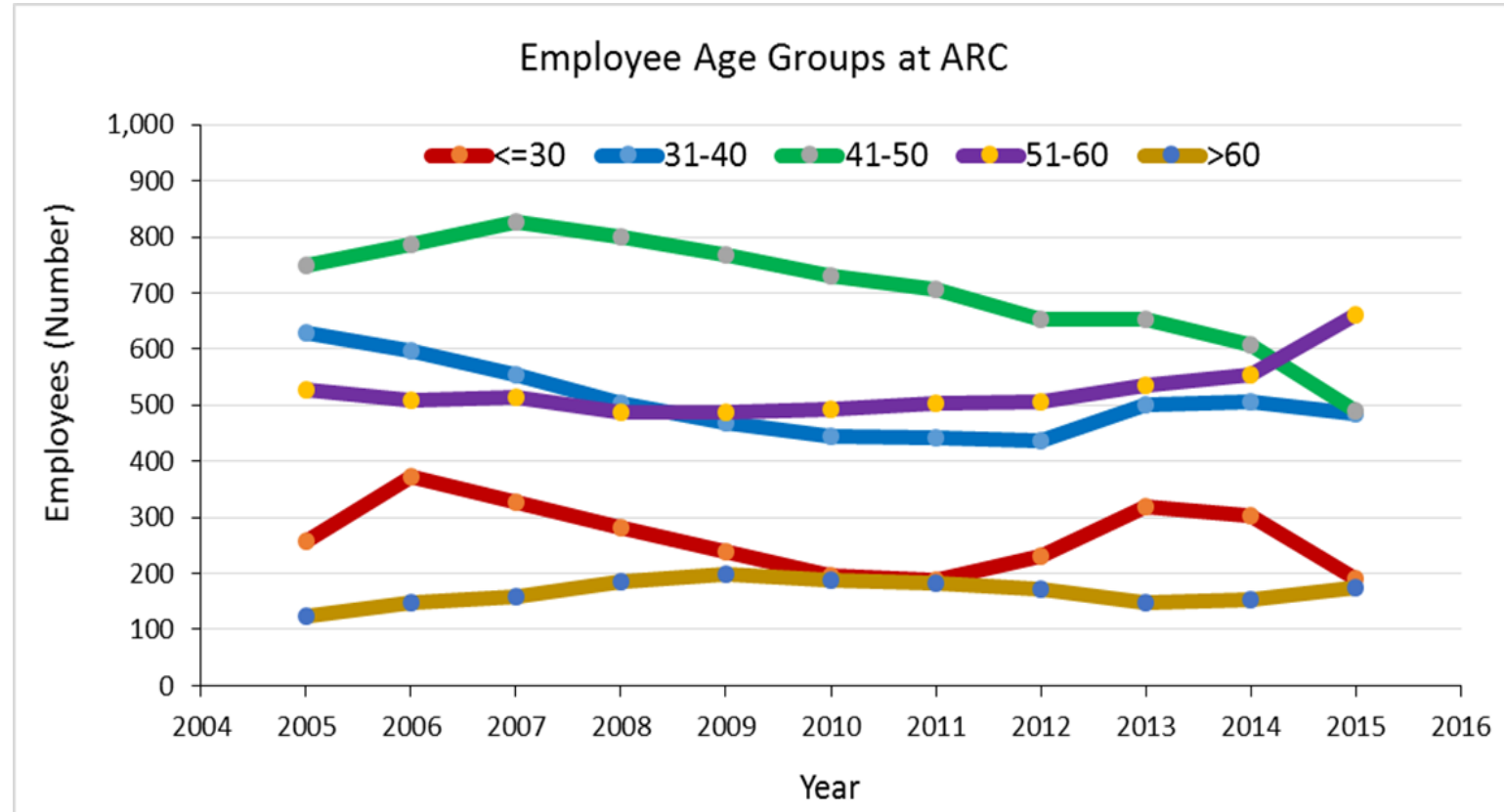
Year	MSc	PhD	Total
2005	228	143	371
2006	248	170	418
2007	216	170	386
2008	240	166	406
2009	238	174	412
2010	249	159	408
2011	270	182	452
2012	240	175	415
2013	240	182	422
2014	213	175	388
2015	196	210	406



AGE DISTRIBUTION OF EMPLOYEES PER YEAR

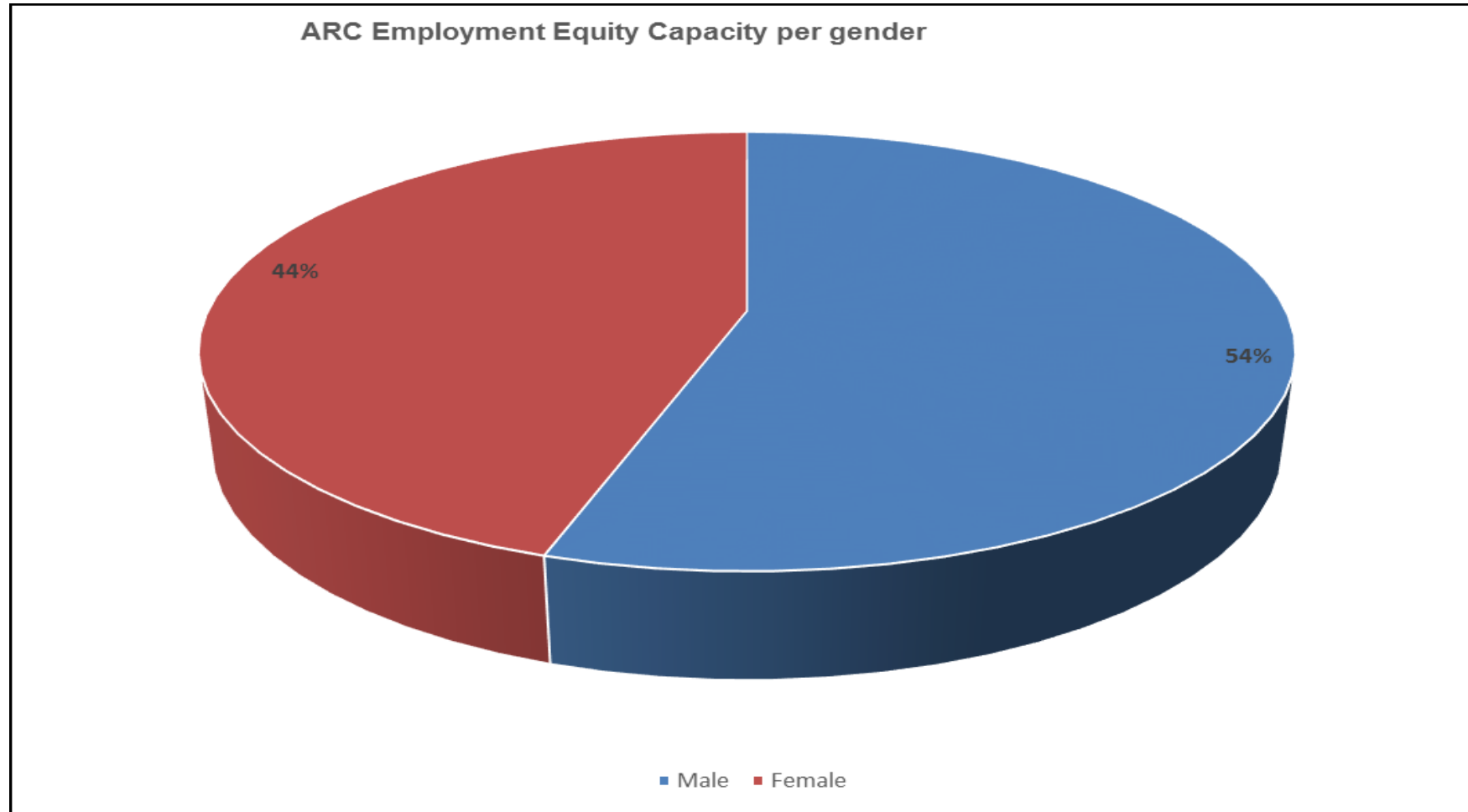
NUMBER OF EMPLOYEES PER AGE GROUP PER YEAR

Year	<=30	31-40	41-50	51-60	>60
2005	257	630	750	528	123
2006	372	596	787	508	147
2007	328	553	828	515	160
2008	281	503	800	488	185
2009	238	469	767	488	199
2010	195	445	730	493	188
2011	188	442	707	503	183
2012	231	438	652	507	173
2013	318	502	653	536	148
2014	303	505	608	554	154
2015	192	486	490	660	174



ARC GENDER DISTRIBUTION OF EMPLOYEES

PERCENTAGES OF MALES TO FEMALES



CRITICAL SUCCESS FACTORS FOR THE ANNUAL BUSINESS PLAN

- 1. Optimal use of resources (finances, equipment, infrastructure & people);**
- 2. Successful recruitment of highly qualified, enthusiastic and energized people;**
- 3. Development of a revised ARC ICT strategy;**
- 4. Review of current funding model and development of a new sustainable funding model in consultation with key stakeholders (e.g. DAFF, DST, NT, Commodity Organizations, Farmers, etc); and,**
- 5. Implementation of recommendations emanating from the ARC External Institutional Review**

COMMENTS/QUESTIONS

**Re a Leboha!
Siyabonga!
Ria Livhuwa!
Ha Khensa!
Siyathokoza!
Re a leboga
Siyabulela!
Baie Dankie!
Thank You**