South African Weather Service

ANNUAL REPORT 2019/20

Climate and Water

TABLE OF CONTENTS

PART A

General Information

3 General information
4 Abbreviations and Acronyms
8 Message from the Minister
10 Message from the Deputy Minister
12 Foreword by the Chairperson of the Board
14 Overview by the Acting Chief Executive Officer
17 Statement of responsibility and confirmation of accuracy for the annual report
18 Members of the Board
20 Executive Management
21 CEO's Executive Report
26 Meteorological Authority
29 Strategic Overview
30 Legislative and other Mandates
31 Organisational Structure

PART B

Performance Information

33 Service Delivery Environment
33 Organisational Environment
33 Key Policy Developments and Legislative Changes
34 Performance Information by Programme
34 *Programme 1: Weather and Climate Services*
51 *Programme 2: Research and Innovation*
62 *Programme 3: Infrastructure and Information Services*
68 *Programme 4: Administration (including Corporate and Regulatory Services)*
73 Performance Information by Strategic Objective (Logframe)

PART C

Governance

79 Governance

PART D

Human Resource Management

88 Human Resource Management

PART E

Financial Information

97 Audit and Risk Committee Report
99 Report of the Auditor-General to Parliament on the South African Weather Service
104 Statement of Financial Position
105 Statement of Financial Performance
106 Statement of Changes in Net Assets
107 Cash Flow Statement
108 Statement of Comparison of Budget and actual Amounts
111 Accounting Policies
138 Notes to the Annual Financial Statements

General Information

PART A

1. GENERAL INFORMATION

Registered name	South African Weather Service
Physical address	Eco Glades Block 1B Eco Park Cnr. Olievenhoutbosch and Ribbon Grass Streets Centurion 0157
Postal address	South African Weather Service Private bag X097 Pretoria 0001
Telephone number	+27 12 367 6000
Fax number	+27 12 367 6300
Email address	SAWS_ceo@weathersa.co.za
Website address	www.weathersa.co.za
External auditors	Auditor-General of South Africa
Bankers	Standard Bank
Company Secretary	Ms Thandi Zide

RP40/2020
ISBN: 978-0-621-48140-2
Title of Publications: South Africa Weather Service Annual Report 2019/2020

ABBREVIATIONS AND ACRONYMS

A-CDM	Airport Collaborative Decision-Making
AASA	Airlines Association of Southern Africa
ACAMS	Advisory Committee for Aeronautical Meteorological Services
ACCESS	Applied Centre for Climate & Earth System Science
ACMA	African Conference on Meteorology for Aviation
ACMAD	African Centre of Meteorological Applications for Development
ACSA	Airports Company South Africa
AFI	Africa-Indian Ocean
AGA	Annual General Assembly
AGSA	Auditor-General South Africa
AIRMET	Airmen's Meteorological Information
AMC	Airport/Aerodrome Management Centre
AMCOMET	African Ministerial Conference on Meteorology
AMF	Aeronautical Meteorological Forecasters
API	Application Programming Interface
APIRG	Africa Planning and Implementation Regional Group
APP	Annual Performance Plan
App	Application
ALF	Aerodrome Licensing Forum
AQMS	Air Quality Modelling and Forecasting System
ARC	Audit and Risk Committee
ARS	Automatic Rainfall Station
ASU	Aviation System Block Upgrades
AT	Apparent Temperature
ATM	Air Traffic Management
ATNS	Aeronautical Traffic Navigation Services
AvRDP	Aviation Research Demonstration Project
AWS	Automatic Weather Station
BSI	British Standards Institution
CAASA	Commercial Aviation Association of Southern Africa
CAC	Civil Aviation Committee
CAeM	Commission for Aeronautical Meteorology
CAMU	Centralised Airspace Management
CARCOM	Civil Aviation Regulatory Committee
CAS	Commission for Atmospheric Sciences
CCMA	Commission for Conciliation, Mediation and Arbitration
CCRA	Climate Change Reference Atlas
CDM	Collaborative Decision Meeting
CoComm	Coordinating Committee

ABBREVIATIONS AND ACRONYMS (continued)

CORSIA	Carbon Ofsetting and Reduction Scheme in International Aviation
CSIR	Council for Scientific and Industrial Research
CSP	Concentrated Solar Power
DBCP	Data Buoy Cooperation Panel
DEFF	Department of Environment, Forestry and Fisheries
DMISA	Disaster Management Institute of South Africa
DMS	Data Management System
DRR	Disaster Risk Reduction
DWD	Deutsche Wetterdienst
EC	Executive Council
ECMWF	European Centre for Medium-Range Weather Forecasts
ERP	Enterprise Resource Planning
ET	Education and Training
ETC	Education and Training of Executive Committee for WMO
ETTCDI	Expert Team on Climate Change Detection and Indices
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EXCO	Executive Committee
GANP	Global Air Navigation Plan
GAW	Global Atmosphere Watch
GFCS	Global Framework on Climate Service
GFS	Global Forecast System
GPC-LRF	Global Producing Centre for Long Range Forecasts
GRAP	Generally Recognised Accounting Practice
HCM	Human Capital Management
HIRA	Hazard Identification and Risk Assessment
HPC	High Performance Computing
ICAD	International Civil Aviation Day
ICAO	International Civil Aviation Organization
iDEWS	Infectious Diseases Early Warning System
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
ImpB	Impact-Based
INAM	Mozambique National Meteorology Institute
ICT	Information and Communication Technology
ICT MSP	Information and Communication Technology Master System Plan
IPCC	International Panel on Climate Change
ISO	International Organization for Standardization
ISS	Integrated Service Strategy
IMTT	Inter-Ministerial Task Team

ABBREVIATIONS AND ACRONYMS (continued)

JCOMM	Joint Commission for Operational and Marine Meteorology
LDC	Least Developed Countries
LDN	Lightning Detection Network
LRB	Limpopo River Basin
LRF	Long Range Forecasting
MASA	Meteorological Association of Southern Africa
MET	Meteorological
METAR	Meteorological Aviation Report
METAREA	Meteorological Area
MEWS	Malaria Early Warning System
MM-EPS	Multi-Model Ensemble Prediction System
MoU	Memorandum of Understanding
MPS	Malaria Prediction System
MRB	Mara River Basin
MRC	Medical Research Council
MREP	Management Report
MSG	METEOSAT Second Generation
NAAQMN	National Ambient Air Quality Monitoring Network
NAC	National Agro-meteorological Committee
NCEP	National Center for Environmental Prediction
NDMC	National Disaster Management Centre
NDMC	National Disaster Management Committee
NFCS	National Framework for Climate Services
NICD	National Institute of Communicable Diseases
NJDCC	National Joint Drought Coordinating Committee
NMS	National Meteorological Service
NOAA	National Ocean and Atmosphere Administration
NRF	National Research Foundation
NWP	Numerical Weather Prediction
OEM	Original Equipment Manufacturer
OHS	Occupational Health and Safety
OCIMS	Oceans and Coastal Information Management System
ORTIA	OR Tambo International Airport
PFMA	Public Finance Management Act
QCTO	Quality Council for Trades & Occupations
QMS	Quality Management System
RA I	Regional Association I
RASG	Regional Aviation Safety Group
RTC	Regional Training Centre

ABBREVIATIONS AND ACRONYMS (continued)

SAAF	South African Air Force
SAAQIS	South African Air Quality Information System
SACAA	South African Civil Aviation Authority
SADC	Southern African Development Community
SAEON	South African Environmental Observation Network
SANBI	South African National Botanical Gardens Institute
SAPRI	South African Polar Research Infrastructure
SARFFGS	Southern African Regional Flash Flood Guidance System
SAWS	South African Weather Service
SAWS Act	South African Weather Service Act, 2001 (No. 8 of 2001 as amended)
SCHOTI	Standing Conference of Heads of Training Institutions
SCOM	Sectoral Committee on Meteorology
SCOPA	Standing Committee on Public Accounts
SEB	Socio-Economic Benefit
SHEQ	Safety, Health, Environment and Quality
SIGMET	Significant Meteorological Phenomena
SIP	Strategic Implementation Plan
SMART	**S**afe, **M**ore informed, **A**lert, **R**esilient, **T**imeous
SMS	Short Message System
SOLAS	Safety of Life at Sea (Convention)
SPC	Strategic Programmes Committee
TAF	Terminal Aerodrome Forecast
THI	Temperature Humidity Index
TT	Thunderstorm Table
TUT	Tshwane University of Technology
UKMO	United Kingdom Meteorological Office
UKZN	University of KwaZulu-Natal
UM	Unified Model
UNFCCC	United Nations Framework Convention on Climate Change
UoR	University of Reading
VFR	Visual Flight Rules
WCSSP-SA	Weather and Climate Science for Service Partnership South Africa
WIS	Weather Intelligence Systems
WMO	World Meteorological Organization
WRC	Water Research Commission
WRR	World Radiometric Reference

message from the **MINISTER**

Barbara Creecy, MP
Minister of Environment, Forestry and Fisheries

I am honoured to present the 2019/20 Annual Report of the South African Weather Service, a public entity of the Department of Environment, Forestry and Fisheries.

SAWS's operations are aligned to national imperatives and strategies, including the National Development Plan's Vision 2030, and the National Climate Change Response Policy. The institution plays an important role in the socio-economic development of the country.

With several severe weather systems occurring during the report period, SAWS again demonstrated the importance of impact-based weather forecasting, early warning systems, adequate research and development and being technologically advanced. Of the 1 455 severe-weather warnings issued, around 639 were related to thunderstorm alerts at an accuracy of 97%.

As part of its regional responsibilities, the SAWS contributed to the Sendai Framework for Disaster Risk Reduction, thereby enhancing its international cooperation and fulfilling its responsibilities as a Regional Specialised Meteorological Centre in terms of the Severe Weather Forecasting Programme (SWFDP) and the Southern African Regional Flash Flood Guidance System (SARFFGS).

SAWS' engagements with the aviation industry continued to demonstrate the importance of its active involvement in issues relating to air safety and the economy. During South Africa's participation in the International Civil Aviation Organisation's 40th Assembly decisions were made regarding space weather and Climate Change, measures were discussed to reduce the aviation industry's carbon footprint.

The current level of effective implementation of meteorological services to support the safety and efficiency of civil air navigation in South Africa stands at 87%, which is amongst the highest in Africa.

To ensure all airports in the country are in compliance and provide safety standards governing aeronautical meteorological service, SAWS and the Civil Aviation Authority visited a number of airports during the year, including the Polokwane International Airport, Kruger Mpumalanga Airport and Rand Airport. These airports had long standing non-conformities related to meteorological equipment, which required attention. Two of the airports have since initiated a process to procure compliant meteorological equipment following our visit.

The Impact-Based Severe Weather Warning System pilot phase, run in collaboration with disaster management centres across the country, continued. Among the new solutions developed for the climate sensitive sectors of the economy were two heat stress indices – the Temperature Humidity Index (THI) and Enthalpy. Both are important for food security as heat stress is a major source of production losses in the dairy, beef, and poultry industries.

SAWS continued its cooperation with the Global Framework for Climate Services (GFCS) by providing high quality data from national and international databases, as well as access to maps, risk and vulnerability analyses and assessments and long-term projections.

In its quest to create a WeatherSMART nation, SAWS increased its presence on online platforms with downloads of the WeatherSMART mobile app increasing by more than 10 000 during 2019/20. This brings the total number of downloads of the APP to 25 121.

The 2019/20 Annual Report of the South African Weather Service complies with the statutory requirements of the Public Finance Management Act and National Treasury Regulations.

Ms Barbara Creecy, MP
Minister of Environment, Forestry and Fisheries

message from the
DEPUTY MINISTER

Ms Maggie Sotyu, MP
Minister of Environment, Forestry and Fisheries

The South African Weather Service has, in the 2019/20 financial year, maintained its high standard of service delivery to all weather sensitive sectors within South Africa and internationally.

Weather forecasting and disaster risk reduction activities were once again of great importance because of their relevance to not only the general public, but also to the agriculture, health and aviation sectors, and the marine industry. The organisation did well to safeguard the lives and property of South Africans and provide meteorological solutions to all South Africans.

These actions were underpinned by research and innovation aimed at developing and enhancing new and existing meteorological solutions suitable for everyday use by all South Africans, while expanding the knowledge-base and intelligence related to Climate Change. Research outputs included a total of 35 peer-reviewed articles in scientific journals, 16 conference papers, and one thesis.

Among the research projects undertaken were three Water Research Commission (WRC) projects to assist decision-makers in weather-sensitive sectors with future planning.

Observation infrastructure challenges, which could have a negative impact on service delivery, related mainly to radar sites, but the relentless work and dedication of the organisation saw an increase in radar network availability from 64% to 91.89%.

The South African Air Quality Information System (SAAQIS), operated jointly by the SAWS and the Department of Environment, Forestry and Fisheries (DEFF), experienced several challenges, including logistics and electricity interruptions, but continued to provide data for the key Vaal Triangle, Highveld and Waterberg high priority areas.

In addition, communities were kept abreast of the latest weather, climate and air quality information via various media platforms, personal interaction and group outreaches. A total of 15 outreaches, including those that are aviation-related, were conducted during the report period. The public continued to support the SAWS website, www.weathersa.co.za, its Facebook and Twitter pages as well as radio and television broadcasts, online news and printed weather news to stay weather aware.

Internationally, SAWS once again made its mark as a leader on the African continent and beyond, as it attended and participated in numerous WMO-related meetings and technical workshops. The organisation furthermore participated in various SADC meetings, amongst which the SADC Cyber-Infrastructure workshop in August 2019, aimed at improving weather and climate early warning systems over southern Africa.

The SAWS continued to play a pivotal role in Africa, providing severe weather prediction and training in the SADC region.

It gives me great pleasure to join the Minister of Environment, Forestry and Fisheries and the SAWS Board and Management in presenting the 2019/20 SAWS Annual Report.

Ms Makhotso Maggie Sotyu, MP
Deputy Minister of Environment, Forestry and Fisheries

foreword by the CHAIRPERSON OF THE BOARD

Ms Nana Magomola
Chairperson of the Board

It is an honour for me to reflect on the work of the South African Weather Service (SAWS) and the role of the Board during the reporting period of 2019/20.

The Board provided strategic direction and leadership in terms of the relationship of SAWS with the Department of Environment, Forestry and Fisheries, stakeholders and the general public.

I had the pleasure to welcome the Minister, Hon. Ms Barbara Creecy to the SAWS in January 2020, where members of the SAWS board and staff could interact with the Minister and showcase the work of the organisation. During this visit, the Minister reaffirmed the Board's direction to further strengthen the positioning of the organisation and to direct our budget towards the maintenance and improvement of our infrastructure as well as showcasing the work of the organisation, especially in terms of the work done in terms of disaster risk reduction.

The SAWS Board oversaw the governance of the organisation, ensuring that the relevant prescripts pertaining to legislation and regulatory frameworks were followed. While we were working on the mandate review regarding the function of the Aviation Meteorological Authority, the Meteorological (MET) Authority continued to develop and implement the safety oversight system for aeronautical meteorology based on the eight critical elements of the safety oversight system.

I am pleased to report that the WMO Leadership and Management of National Meteorological and Hydrological Services in Africa Conference was held in November 2019 and turned out to be a huge success, with a participation rate of 76% (41 countries out of 54). This conference was significant as it allowed leaders of African Meteorological Services to share experiences and learn from each other on dealing with the challenges facing their organisations. The SAWS was also able to display its capabilities and abilities in the SADC region and the continent during this conference.

On the international front, SAWS participated in the 18th WMO Congress from 3 to 14 June 2020 and also aligned its processes according to the WMO prescripts by nominating a South African official to serve in the WMO Research Board; confirming its Hydrological adviser in efforts to assist WMO and nominating various South African experts to serve on WMO Infrastructure and Services Commissions. While the organisation was working full steam to improve its international standing, the onset of Covid-19 and subsequent lockdown in late March 2020, lead to the cancellation of scheduled international visits. These visits will be rescheduled for a future, more appropriate date.

The SAWS continued to deliver an excellent service to its stakeholders. The survey conducted amongst our aviation clients once again confirmed our aviation meteorological

products to be of a very high and reliable standard. Simultaneously, our stakeholder engagements continued and consisted of outreaches to municipalities and communities; career exhibitions and weather awareness, as well as aviation and disaster risk reduction.

The SAWS continued to develop relevant products to protect and minimise weather related risks to vulnerable communities while also providing sector specific products on weather and climate to assist targeted business sectors. The South African Weather Service is continuously challenged by underfunding with a government grant that is decreasing in real terms. While the need for technological infrastructure maintenance and improvement remains an organisational priority, the lack of income due to the lockdown associated with the Covid-19 disease reduced the organisation's income substantially and continued to do so after the end of the 2019/20 financial year. The organisation will have to find innovative ways to recover from this severe financial setback in future financial years.

I would like to take this opportunity acknowledge the roles played by our Hon. Minister Barbara Creecy and Hon. Deputy Minister Maggie Sotyu in supporting and guiding the organisation during the year under review. I also want to thank all Board members, the SAWS Executive and staff for their commitment during 2019/20 and proudly join the Minister, Deputy Minister and the Executive team in presenting the Annual Report.

Ms Nana Magomola
Chairperson of the Board

overview by the

ACTING CHIEF EXECUTIVE OFFICER

Mr Mnikeli Ndabambi
Acting Chief Executive Officer

The South African Weather Service provides services relating to weather, climate and air-quality related solutions and services. The foundation of these services is found in the wealth of research and innovation initiatives undertaken by the organisation, with all operational activities depending highly on the full functioning of our infrastructure and information systems. Our operational services are supported by several crucial administrative services.

Programme 1: Weather and climate services

During the report period, rainfall in the drought-stricken Cape provinces improved and started filling the dams again during winter. With the onset of the summer rainfall, we experienced somewhat unseasonal systems, as the normal prolonged, good rainfall events, typical of this period, did not occur. This was also in line with the seasonal forecast for the late summer period, where lower than expected rainfall occurred, due to a weak to neutral El Niño that was predicted.

Several severe weather events occurred, and in support of our quest to protect citizens and their properties against the impacts of severe weather, the pilot project for the Impact-based warning system continued in collaboration with the Disaster Management authorities.

Our aviation meteorological services were delivered accurately and on time, while we complied with requirements as per the ICAO Annexure 3 and SACAA requirements. Towards the end of the report period, COVID-19 contingency measures were introduced, seeing the start of a stand-still in the use of our services to the aviation community, in terms of Terminal Aerodrome Forecasts (TAF), TREND forecasts and Significant Weather Charts in this period. It is expected that the effect of lockdown on the new financial year would be much more pronounced as this led to the organisation losing a large portion of its commercial income.

In terms of Marine meteorological services, we conducted research in the fields of Safety at Sea and Coastal safety; Sea Ice charting; Development of high-resolution marine products and Ocean observations (coastal, offshore and Southern Ocean) among others. We continued to provide in-situ met-ocean data observations which added to the improvement of the observations and climate database for the data sparse regions of the southern Hemisphere – thereby contributing to an improvement in our weather and climate prediction capabilities.

In terms of climate service product development, several specialised climate forecast products were developed, benefiting future sustainable agricultural processes.

Through various dissemination channels, we expanded our reach to ensure that our information can be accessed by all South Africans, including people living with disabilities. Current dissemination channels include television, radio, mobile applications, social media, web portals and application programming interfaces, with the widest reach still obtained through radio and television.

Programme 2: Research and innovation

The South African Weather Service established a performance rating system for its research output, aimed at positioning and rating the performance of the organisation's scientific output amongst the science institutions in South Africa.

Thirty-five scientific articles, 16 conference papers and one thesis were published, thereby contributing to the dissemination of weather, climate and air quality science to the scientific community and the broader public.

Highlights of the Earth system sciences included our numerical weather and climate modelling, atmospheric composition modelling, agro-hydro-meteorological modelling and numerical models development, while substantial progress was made with seven key projects. Five weather product solutions were developed which included: A Lightning nowcasting product, an Impact-Based AvRDP product, a Multi-Model Ensemble Prediction System (EPS), a Malaria Prediction System (MPS) product, and an Air Quality scenario tool for the Mpumalanga province.

Programme 3: Infrastructure and Information systems

Infrastructure was optimally managed and maintained, although our equipment and instrumentation had unplanned failures due to load shedding, aging infrastructure and other conditions.

The availability of our radar network increased significantly to 91.9% against the target of 80%, as a result of the successful implementation of the Radar Business Case Implementation Plan. Our Lightning Detection Network performed above expectation of 90% at 92%, while our Automatic Weather Stations, at 87.7%, also exceeded the target of 85%. Our Automatic Rainfall Stations performed slightly under the 85% target, at 82.7%.

During the period under review, the SAWS Global Atmosphere Watch Programme achieved 86% availability of data recovery.

While SAWS acknowledged the increasing need for Information and Communication Technology to drive innovation, automate business processes and improve service delivery, our system availability maintained a level above 99.2%.

The SAWS, as the custodian of the South African Air Quality Information System (SAAQIS) was responsible for the operation and maintenance of fifteen stations that form part of the National Priority Area ambient air quality monitoring networks and achieved greater than 80% data availability for these networks in spite of challenges.

Programme 4: Administration

In terms of commercial revenue, the organisation focused on generating more non-regulated commercial revenue and a total of R 35.67 million was realised for the year, which was 1.92% below the year-to-date budget of R 36,19 million.

The organisation appointed ten student forecasters who were in training in 2019 and have placed them at various offices where the need was critical. An eleventh forecaster could not be appointed due to the lockdown. Furthermore, the critical post of Senior Manager: Technical Services was filled in February 2020.

A number of scarce and critical skills appointments were made, and ten new forecasting learners started their forecasting course in February 2020. With the COVID-19 lockdown, lecturing went online. The percentage attrition rate of 1% was achieved during the period, bringing the annual target to 6% which was within target.

The B-BBEE target remained elusive as the organisation still could not obtain a valid B-BBEE certificate. A B-BBEE Task team was established and a champion duly appointed to coordinate the collation of various documentation required to achieve an improved rating. As part of efforts towards the improvement of B-BBEE, the Employment Equity focus will be towards Persons with Disabilities and the targeting of TVET Colleges for trade skills needed in the organisation. Furthermore, spending on management training will be through established partnerships with Universities such as Henley and GIBS Business School, as well as Stellenbosch University.

Dealing with financial performance, an operating deficit of R 8,898 million before depreciation and amortisation (deficit of R 46.72 million after Depreciation and Amortisation) was realised for the year ending 31 March 2020. The total annual provision for doubtful debts amounted to R 18,471 million as per R 1 million from receivables from exchange transactions and R 17 million from statutory receivables. Recoupment of revenue from the aviation sector remains a challenge as entities such as SAA and SA Express are facing challenges of their own.

The organisation continued to have outreach activities for students and communities alike. There might be future challenges to implement the District Development Model in the new financial year due to COVID-19 social distancing regulations. The organisation started to develop alternative ways to ensure that critical life-saving weather information is received and understood by the public, especially those in communities vulnerable to the effects of the weather.

In respect of Stakeholder engagement and network development, the organisation managed to implement 89% of its stakeholder development plan, slightly exceeding the expected 85% target for the year, while we managed to exceed our annual target of total annual advertising value equivalent of R 294 million (versus an expected R 155 million). This was mainly due to the delivery of additional broadcasting services since the end of 2019.

Plans of the organisation to host its flagship World Meteorological Day Weather SMART seminar in March 2020 were unfortunately cancelled due to the onset of the COVID-19 pandemic in South Africa. The symposium was cancelled two weeks ahead of the due date, as a directive from the Minister to cancel any meetings larger than 100 people was received.

The pandemic and emergency measures around that developed very quickly, with SAWS having to get ready for level 5 lockdown from 29 March 2020. Our disaster response plans were revised and approved, allowing limited essential services to continue at the workplace, while ensuring that 95% of staff could work from home. A task team was formed, with regular communication updates to staff. These measures inspired the organisation to ensure that all remote meeting capabilities and access were in place – thereby ensuring ongoing service delivery and efficiency.

The organisation in the previous financial year ending 31 March 2019, received a qualified audit opinion, however, for the current financial year ending 31 March 2020, the organisation managed to achieve an unqualified audit opinion. All the matters previously raised by the Auditor-General in the previous financial year were resolved resulting in an unqualified audit opinion.

I would like to thank the Minister, Board, the executive, managers and all staff for their continued contributions to ensure the sustainability of the organisation.

Mr Mnikeli Ndabambi
Acting Chief Executive Officer

2. STATEMENT OF RESPONSIBILITY AND CONFIRMATION OF ACCURACY FOR THE ANNUAL REPORT

The Chief Executive Officer (CEO) is responsible for the preparation of the public entity's performance information and for the judgements made in terms of this information.

The CEO is responsible for establishing and implementing a system of internal controls designed to provide reasonable assurance as to the integrity and reliability of performance information.

In our opinion, the performance information contained in this report is a fair reflection of the actual achievements against planned objectives, indicators and targets as per the Strategic and Annual Performance Plans of the public entity for the financial year ended 31 March 2020.

All information and amounts disclosed in the annual report are consistent with the annual financial statements audited by the Auditor-General. The annual financial statements (Part E) have been prepared in accordance with the Generally Recognised Accounting Practice (GRAP) standards applicable to the public entity.

The performance information of the entity, as attached hereto, was approved by the Board at its meeting on 29 July 2020.

Mr Mnikeli Ndabambi
Acting Chief Executive Officer

Ms Nana Magomola
Board Chairperson

MEMBERS OF THE BOARD

Ms Nana Magomola
Board Chairperson

Dr Phillip Dexter
Deputy Chairperson

Adv Derick Block

Mr David Lefutso

Dr Mphekgo Maila

Ms Kelebogile Moroka-Mosia

Ms Sally Mudly-Padaychie

Dr Tsakani Ngomane
DEFF representative

Mr Itani Phaduli

Ms Feziwe Renque

Mr Mnikeli Ndabambi
Acting Chief Executive Officer until
19 September 2019 and
from 21 March 2020

Dr Jona Mphepya
Acting Chief Executive Officer from
20 September 2019 – 20 March 2020

Ms Thandi Zide
Board Secretary

EXECUTIVE MANAGEMENT

Mr Mnikeli Ndabambi
Acting Chief Executive Officer until 19 September 2019 and from 21 March 2020

Dr Jonas Mphepya
Acting Chief Executive Officer from 20 September 2019 – 20 March 2020

Ms Busisiwe Shongwe
Chief Financial Officer until December 2019

Ms Julia Mphafudi
Executive: Corporate and Regulatory Services until 12 February 2020

Dr Deon Terblanche
Acting Executive: Infrastructure and Information Services until 30 June 2019

Mr Lulama Gumenge
Acting Chief Financial Officer from 17 December 2019

Mr Tabani Mhlongo
Acting Executive: Infrastructure and Information Services from 1 July – 30 September 2019

Mr Tshepho Ngobeni
Acting Executive: Weather and Climate Services from 1 October 2019 – 26 March 2020; acting Executive: Infrastructure and Information Services from 27 March 2020

Mr Tebatso Kekana
Acting Executive: Corporate and Regulatory Services from 13 February 2020

3. CEO'S EXECUTIVE REPORT

Report by the Chief Executive Officer to the Executive Authority and Parliament of the Republic of South Africa.

PREPARATION AND PRESENTATION OF THE ANNUAL FINANCIAL STATEMENTS

The Annual Financial Statements were prepared in accordance with the South African Statements of Generally Recognised Accounting Practice (GRAP) including any interpretations of such Statements issued by the Accounting Standards Board.

The South African Weather Service (SAWS) complies with the Public Finance Management Act (PFMA), 1999 (No.1 of 1999); Treasury Regulations; the Companies Act; and the principles of Good Corporate Governance recommended by King IV in managing its financial affairs. The Annual Financial Statements for the year ended 31 March 2020 were compiled on the going concern basis as it is expected that SAWS will continue operations in the foreseeable future.

GENERAL REVIEW OF THE STATE OF AFFAIRS

The SAWS is the primary provider of weather and climate-related information within South Africa, as legislated in the South African Weather Service Act, 2001 (No 8 of 2001 as amended) – also referred to as the "SAWS Act". It supplies weather-related information to the public at large as part of its public good mandate, for which a government grant is received to support this activity.

The SAWS furthermore provides weather-related information to the aviation industry on a cost recovery basis through a regulated tariff. The Regulating Committee on Meteorological Services (RCMS) plays a pivotal role to ensure that the recommended tariff is just and fair to all parties involved and recommends accordingly to the Minister of Environment, Forestry and Fisheriess for approval and subsequent promulgation in the Government Gazette.

The Act also allows SAWS to provide weather and climate-related information to commercial clients from industries such as mining, insurance, tourism, telecommunication, municipalities and other international meteorological organisations.

According to the Act, SAWS is the custodian of the South African Air Quality Information System, which includes the selling of ambient air-quality or meteorological information packages.

Revenue

The Total Revenue increased by 16,21% from R 382,76 million to R 444,82 million year-on-year.

Table 1: Movement in Revenue 2019/20 versus 2018/19 (year-on-year)

REVENUE	2019/20 R	2018/19 R	VARIANCE R	VARIANCE %
Revenue from non-exchange transactions				
Revenue from non-exchange transactions – operational expenditure	**270 945 597**	**209 488 223**	**61 467 374**	**22,68%**
- Government grant – operational and capital expenditure	259 355 163	209 488 223	60 772 374	31,59%
- Government grant – SAAQIS	11 590 434	-	685 000	4,00%
Contributions and donations	**4 790 479**	**6 844 361**	**(2 053 882)**	**-30,01%**
- TETA-SETA grant	1 070 893	1 511 125	(440 232)	-29,13%
- Donor funding – research projects	3 719 586	5 333 236	(1 613 650)	-30,26%
Revenue from non-exchange transactions	**275 736 076**	**216 332 584**	**59 403 492**	**27,46%**
Revenue from exchange transactions				
Regulated commercial revenue				
- Aviation	**128 494 477**	**128 234 129**	**260 348**	**0,20%**
Non regulated commercial revenue	**35 673 040**	**32 374 551**	**3 298 489**	**10,19%**
- Aviation instruments maintenance income	1 084 680	797 307	287 373	36,04%
- Air quality revenue	844 055	5 891 089	(5 047 034)	-85,67%
- Information fees	21 706 314	17 647 285	4 059 029	23,00%
- Training – Regional Training Centre	897 362	880 653	16 709	1,90%
- Lightning detection network sales	6 432 599	5 751 552	681 047	11,84%
- Sale of instruments	4 708 030	1 406 665	3 301 365	234,69%
Total commercial revenue	**164 167 517**	**160 608 680**	**3 558 837**	**2,22%**
Other revenue	**4 912 184**	**5 822 722**	**(910 538)**	**-15,64%**
- Miscellaneous income	(126 217)	1 175 813	(1 302 030)	-110,73%
- Interest received from receivables	1 324 186	53 943	1 270 243	2354,79%
- Income from investments	3 714 215	4 592 966	(878 751)	-19,13%
Revenue from exchange transactions	**169 079 701**	**166 431 402**	**2 648 299**	**1,59%**
Total revenue	**444 815 777**	**382 763 986**	**62 051 791**	**16,21%**

Government Grant

The total Grant income increased by 22,68% (R 61,46 million) from R 209,49 million to R 270,95 million year-on-year. Included under the Grant income is a Capital Expenditure Grant of R 66,87 million (2018/19: R 9,51 million).

Aviation Income

Aviation income increased by 0,20% from R 128,23 million to R 128,49 million year-on-year. This result is mainly due to higher air traffic volumes.

Non-Regulated Commercial Income

Non-regulated commercial revenue increased by 10,19% from R 32,37 million to R 35,67 million year-on-year, mainly due to increased sales of Meteorological Instruments, Lightning Detection Network equipment, Aviation Information Fees and improved revenue from the Regional Training Centre, which contributed to a combined revenue increase of 32% year-on-year.

Other Income

Interest from investments decreased by 19,13% from R 4,59 million to R 3,71 million year-on-year. The interest income decrease is attributed mainly to increased expenditure during the financial year.

The relation between externally and internally generated revenue is reflected in Table 2 below.

Table 2: Relation between Externally and Internally Generated Revenue

	2020	2019
Internal Revenue as % of Total Revenue	61%	55%
External Revenue as % of Total Revenue	39%	45%

- Internal revenue comprises all Government Grant Revenue and TETA Grants; and
- External revenue comprises Aviation
  - Non-regulated Commercial
  - and Other Revenue.

Expenditure

Total Expenditure increased by 9,65% from R 445,22 million to R 482,36 million year-on-year.

Table 3: Total Expenditure consisted of the following:

DESCRIPTION	2019/20 R	2018/19 R	VARIANCE	
			R	%
Administrative	9 572 132	11 558 015	(1 985 883)	-17,18%
Employee costs	277 548 027	261 335 504	16 212 523	6,20%
Amortisation	2 835 629	1 946 152	889 477	45,70%
Depreciation	25 810 053	21 786 601	4 023 452	18,47%
Impairment loss	10 186 006	4 878 144	10 186 006	208,81%
Bad debts written-off	1 807 484	-	1 807 484	-100,00%
Finance costs	-	953 196	-	100,00%
Other operating expenses	154 600 817	142 758 677	11 842 140	8,30%
TOTAL EXPENDITURE	**482 360 148**	**445 216 289**	**42 975 199**	**9,65%**

Administrative Expenditure

Administrative Expenditure decreased by R 1,99 million year-on-year from R 11,56 million to R 9,57 million mainly as a result of cost-cutting measures that were applied during the year.

Employee Costs

Compensation of Employees increased by 6,20% year-on-year to R 277,55 million (2018/19: R 261,34 million) and made up 57,54% (2018/19: 58,70%) of the **Total Expenditure**.

Operating Expenditure

Other operating expenses increased by 8,30% (R 11,84 million) from R 142,76 million to R 154,60 million year-on-year. The increase in operating expenditure, even though higher than the average Consumer Price Index (CPI) over the year, is attributed to the volatility in the Rand exchange rate when compared to other foreign currencies, regulatory price increases such as electricity and diesel costs, and other contractual agreements whose increase is higher than the average CPI.

SUPPLY CHAIN MANAGEMENT SYSTEM

The SAWS maintains an appropriate procurement and provisioning system which is fair, equitable, transparent, competitive and cost-effective, in accordance with the Public Finance Management Act, 1999 (No 1 of 1999, as amended); Treasury Regulation 16A; Cost Containment Measures as issued by National Treasury and other applicable legislative frameworks.

POST-RETIREMENT MEDICAL AID BENEFIT

The SAWS has a Defined Benefit Liability in the form of a Post-Retirement Medical Aid Benefit Plan (PRMA) for all staff employed before November 2008. This obligation has been funded by payments from the entity and its employees, taking into account the recommendations of the independent qualified actuaries.

Actuarial gains and losses are recognised in surplus or deficit in accordance with GRAP 25.

As at 31 March 2020, SAWS' liability on the Post-Retirement Medical Aid (PRMA) decreased from R 4,13 million to R 2,64 million. The decrease was due to a decline in the number of employees entitled to the PRMA both in service and in continuation, and the increase in the net discount rate from 2,32% to 4,10% year-on-year.

This *Non-current Liability* represents a total of 49 employees (2018/19: 50 employees), of which 32 of these employees (2018/19: 31) are already on retirement/pension while the remaining 17 (2018/19: 19) are still in service.

BUDGETED REVENUE AND EXPENDITURE COMPARED TO ACTUAL

During the year under review, SAWS realised a Deficit of R 46,72 million (2018/19: R 71,03 million).

Total revenue for the year was below budget by R 18,969 million amounting to R 444,82 million (Budget: R 463,79 million), while total expenditure was above budget by 10,98% (Actual: R 482,36 million).

SERVICES RENDERED BY THE SOUTH AFRICAN WEATHER SERVICE

A list of services rendered by SAWS and the significant events that took place during the year, including major projects undertaken, are discussed in detail in the Annual Report.

CAPACITY AND OTHER CONSTRAINTS

Funding Sources – SAWS' optimal productivity relies heavily on the availability of financial enablers to ensure that the desired yields on the investment are attained. It is in this context that SAWS continues to rely heavily on the support from Government in the form of a grant allocation from the Shareholder, which is significant in ensuring the long-term sustainability of the entity.

Operational Capacity – Global trends and developmental pressures have propelled organisations similar to ours to invest more heavily in capacity building, such as modern technology and human capital. The enhancement in capital injections and technology ensures that there are up-to-date enablers to assist in generating relevant applications in research that will assist government in planning- and decision-making processes. It is highly desirable that the South African Weather Service takes a leading role in this process. The success of these projects could be derailed by a lack of funds invested in advanced technology and human capital, a necessary resource to drive these processes.

During the 2019/20 financial year, SAWS was allocated R 93,52 million towards capital expenditure and early warning systems.

Employees – In as much as there has been marked progress in the attraction and retention of skills, as demonstrated by the steadily declining turnover figures in critical and scarce skills, there is also an equally demanding challenge to maintain these figures and provide such employees with a conducive environment within which to operate.

Part of that responsibility is to create a larger pool of scientists and technologists with greater focus on the Previously Disadvantaged Individuals. However, without the necessary financial resources, it is a tall order to achieve these objectives, more so because these are part of the SAWS mandate, as per the SAWS Act.

SAWS continues to provide bursaries for external students who, at the end of their studies, are given opportunities to work at SAWS either through internships and/or full time employment. Most of the students on the scientific internships are subsequently employed on a full-time basis.

CORPORATE GOVERNANCE ARRANGEMENTS

The SAWS is committed to the objectives and principles of transparency; accountability; and integrity as explained in the ***King IV Report on Corporate Governance***. A detailed discussion of the application and results of Corporate Governance in the organisation is provided in the Annual Report.

Risk Management is disclosed under Note 35 in the Annual Financial Statements, whereas Related Party Transactions are reflected in Note 33 in the Annual Financial Statements.

Disclosure of ***Remuneration to Members of the Accounting Authority*** and Executive Management is disclosed in Note 33 in the Annual Financial Statements.

The ***SAWS Strategic Plan***, which sets out the direction for the entity for the next five years, was developed by the Board and approved by Parliament and is aligned to the key Government priorities, including the National Development Plan relevant to the mandate of SAWS.

The *Audit and Risk Committee* meets on a regular basis and ensures that management adheres to internal controls; accounting policies; and procedures. This Committee is chaired by an independent person and the majority of its members are non–executive board members, which include two external members who are non-board members.

SizweNtsalubaGobodo were appointed in the 2017/18 financial year as the entity's internal auditors for a period of three years.

The *Audit and Risk Committee* has adopted formal terms of reference and this Committee is satisfied that it covered its responsibilities for the year in compliance with its term of reference. (Refer to Report of the Audit and Risk Committee in the Annual Report).

PERFORMANCE INFORMATION

Performance targets are set on an annual basis - refer to the specific section in the Annual Report for the disclosure of these targets and related performance. Quarterly performance reports are prepared by the SAWS and submitted to the Department of Environment, Forestry and Fisheries stating achievements during the previous year and assessing results against current year targets set.

EVENTS AFTER THE REPORTING DATE

Management is not aware of any matter or circumstances arising since the end of the financial period which would affect the figures, as disclosed in the Annual Financial Statements.

FRUITLESS AND WASTEFUL EXPENDITURE

Fruitless and wasteful expenditure is disclosed under Note 36 of the Annual Financial Statements.

IRREGULAR EXPENDITURE

Irregular expenditure is disclosed under Note 37 of the Annual Financial Statements.

DISCONTINUED ACTIVITIES/ ACTIVITIES TO BE DISCONTINUED

There were no discontinued activities during the period under review and there is no plan to discontinue activities in the 2019/20 financial year.

4. METEOROLOGICAL AUTHORITY

Overview

As the designated aeronautical meteorological authority for South Africa, the South African Weather Service (SAWS) has an obligation under Article 28 of the Convention on International Civil Aviation ("Chicago Convention") to establish adequate facilities and related meteorological services to support the safety and efficiency of civil air navigation in South Africa. These facilities and related meteorological services must be established and provided in accordance with international standards such as those set out in various Annexes to the Convection on International Civil Air Navigation. The standards governing the provision of aeronautical meteorological services and related facilities are contained in ICAO Annex 3 – *Meteorological Service for International Civil Air Navigation*.

The meteorological authority unit was established as an independent structure within SAWS. The primary function of the Meteorological Authority is to exercise oversight over aeronautical meteorological services and related facilities. The aim is to ensure that the above standards are met so that civilian flight operations in South Africa are conducted in a safe and efficient manner. In addition, the Meteorological Authority contributes to the establishment and maintenance of safety oversight system which is a component of the State Safety Programme (SSP). The SSP is an integrated set of regulations and activities aimed at the improvement and administration of civil air navigation safety by the State.

Our work contributes to the development and safety of civil air navigation and ensures that South Africa continues to maintain a high level of safety record in Africa and the world with respect to the number of aircraft accidents and incidents. The air transport industry is a key catalyst for economic development globally. It supports key sectors of the economy (i.e. trade and tourism) thus contributing to socio-economic development in most countries, particularly in Africa.

During the year under review, the Meteorological Authority conducted several key activities, which were aimed at enforcing adherence to safety standards in order to ensure that air transport is conducted in a safe and efficient manner and that the safety of life and property is prioritised.

Safety oversight system

The safety oversight system is a critical component of the state safety programme. The International Civil Aviation Organization (ICAO) has developed a framework upon which states can build an effective safety oversight system based on eight critical elements of the state safety oversight system. These elements are summarised below, and their effective establishment and implementation are subject to rigorous auditing by ICAO under its universal safety oversight audit program. The current level of effective implementation for South Africa stands at 87% which is amongst the highest in Africa and the world. During the reporting year, the Meteorological Authority has contributed significantly to the development and implementation of the State safety oversight system, particularly in key areas as summarised in the next sections of this report.

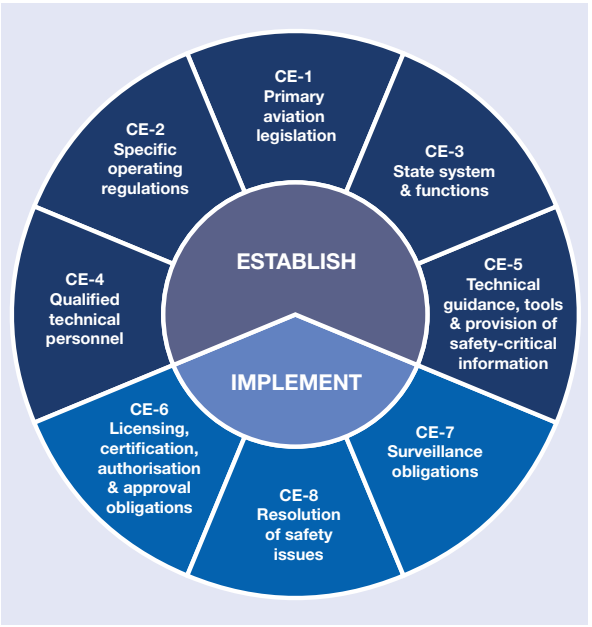


Chart 1: Critical elements of the State Safety Oversight System.

Regulations development

During the period under review, the MET Authority contributed to the development of the State safety oversight system by developing provisions for amendment of regulations governing aeronautical meteorological service provision in line with critical element (CE-2). This work was undertaken through a consultative process managed by the Civil Aviation Regulatory Committee (CARCOM). CARCOM comprises stakeholders from various sectors of the aviation industry who are actively involved in the vetting and approval of civil aviation regulations. The meteorological authority successfully tabled proposals for amendment of regulations governing aeronautical meteorological provisions.

Surveillance Activities

In the last financial year, the Meteorological Authority successfully implemented its master surveillance programme. The programme is developed and implemented in compliance with critical element (CE-6) dealing with surveillance activities. Under this programme, our team of inspectors conducted 24 airports inspections (OR Tambo, King Shaka, Pietermaritzburg, Mthatha, Cape Town, Mahikeng, Pilanesberg, Polokwane, Kruger Mpumalanga, Grand Central, Bram Fischer, Kimberley, Upington, Rand, Lanseria, Wonderboom, Richards Bay, East London, Port Elizabeth, Virginia, Phalaborwa, Margate, Skukuza and George airports).

The scope of our inspections was primarily focused on the assessment of meteorological equipment installed at airports and used to support flight operations. The standards require that this equipment be properly maintained and calibrated in order to provide accurate measurements of atmospheric elements such as temperature, pressure, humidity and surface wind speed and direction. These elements are critical for safe operation of aircraft and are used in planning and tactical decision making by pilots. Similarly, technical personnel responsible for their maintenance must be well trained and accredited to work on this equipment.

Table 4 below summarises key findings (safety hazards) identified by our team of inspectors as having significant impact to the safety of flight operations. The findings are listed by type of airport ownership.

Table 4: Summary of most common key findings per airport ownership.

TYPE OF FINDING / OWNERSHIP	LACK OF PERSONNEL ACCREDITED	NON-COMPLIANT MET EQUIPMENT	LACK OF SERVICE LEVEL AGREEMENT (SLA)
Airports Company South Africa (ACSA)	0	0	0
Municipality	4	2	4
Provincial Government	3	3	3
Private	2	3	2
TOTAL	9	8	9

Aerodrome Licensing Forum (ALF)

The Meteorological Authority is a member of the aerodrome licensing forum (ALF). The ALF is a forum within the South African Civil Aviation Authority (SACAA) responsible for issuance of aerodrome licenses to airports. The ALF convenes meetings of various stakeholders (audit areas) within the Civil Aviation Authority (CAA). The purpose of these meetings is to enable audit areas to report on the outcomes of their surveillance activities (i.e. inspections). The reports are used to determine whether aerodromes should be licensed or not, based on the nature of issue presented. The Meteorological Authority participated in all the ALF meetings during the reporting period and provided inputs regarding the compliance status of meteorological equipment at airports across the country.

Out of 24 airports that were inspected during the reporting period, 11 (46%) were not recommended for licensing by the Meteorological Authority. The main reason being that hazards were identified which have the potential to impact negatively on the safety of flight operations at these airports. Our key findings related to lack of accreditation of technical personnel as well as calibration of meteorological equipment, and most aerodromes had long-standing findings.

Stakeholder management

The Meteorological Authority in collaboration with the South Africa Civil Aviation Authority (SACAA) visited three airports during the reporting period. The purpose of these visits was to raise awareness about the importance of compliance with safety standards governing aeronautical meteorological service provision. The airports visited were Polokwane International Airport, Kruger Mpumalanga Airport and Rand Airport. These airports had long standing non-conformances related to meteorological equipment which needed to be addressed as a matter of urgency. Two of the above airports have since initiated a process to procure compliant meteorological equipment following our visit.

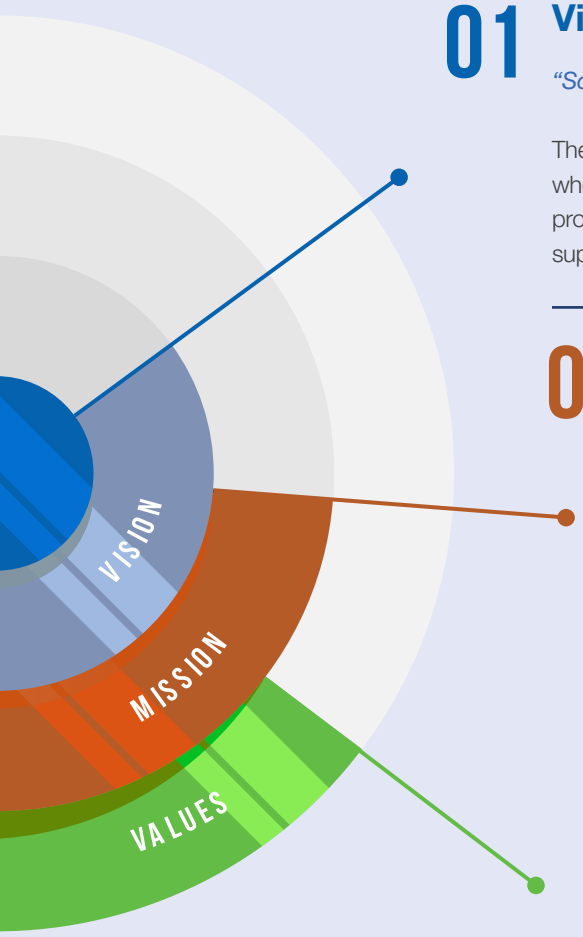
The Meteorological Authority continued to help and provide guidance to airport authorities who sought our assistance in determining whether their equipment was in compliance with our regulations. We visited Skukuza, Margate and Sishen and are pleased to report that these airports have demonstrated commitment to complying with our regulations. Skukuza has initiated the process of procuring compliant meteorological equipment. Margate has completed a corrective action plan under the guidance of our team of inspectors.

Capacity development

The Meteorological Authority has continued to place emphasis on the training of its personnel. ICAO specifically requires that training programmes and training plans be implemented for technical personnel responsible for safety oversight. During the 2019/20 reporting period, the Meteorological Authority successfully implemented its training plan for the 2019/20 financial year. Two training programmes were completed as part of the plan, namely Technical report writing; and monitoring and evaluation. Technical report writing is significant because it would enable the inspectors to write professional investigative reports pertaining to their work. Training in monitoring and evaluation will enable the development of a system to monitor continuous adherence to safety standards.

5. STRATEGIC OVERVIEW

The Management and staff of SAWS are committed to the Vision, Mission and Core Values of the organisation and actively contribute to, and support all initiatives aimed at achieving organisational goals and objectives.



01 Vision

"South African Weather-related Solutions for everyone, everyday"

The vision articulates clearly the desired end state in which SAWS is central to a situation where citizens, communities and business sectors are able to use the information, products and services across the weather, climate and related environmental space to support socio-economic development and build resilience.

02 Mission

"To provide weather, climate and related environmental (meteorological) solutions in support of improved safety and quality of life of people in South Africa"

SAWS will realise this through:

- Thought leadership in meteorological, climatological and other related sciences;
- The development of relevant and innovative applications and products utilising cutting edge technology; and
- Establishing and leveraging collaborative partnerships.

03 Core Values

- Integrity
- Collaborative
- Solution oriented science
- Passion for service excellence

Brand promise

Making you WeatherSMART

Safe
More informed
Alert
Resilient/Ready
Timeous

This is the promise that will permeate all SAWS products, services, associated marketing and brand promotion.

Operating principles

These operating principles form the bedrock of SAWS operations:

- Responsible governance
- Innovation and continuous improvement
- Simplicity – Making weather data understandable, relevant and applicable and engaging stakeholders in an understandable way
- Ensuring the availability of relevant expertise
- Quality consciousness
- Customer centricity
- Team work and collaboration

6. LEGISLATIVE AND OTHER MANDATES

The South African Weather Service (SAWS) is a Schedule 3A entity in terms of the Public Finance Management Act (PFMA), 1999 (No. 1 of 1999) and relevant Treasury regulations and derives its mandate from the South African Weather Service Act, 2001 (No. 8 of 2001) as amended by the South African Weather Service Amendment Act, 2013 (No. 48 of 2013).

The objectives of SAWS are to:

- Maintain, extend and improve the quality of meteorological services for the benefit of all South Africans.
- Provide public good services and commercial services to all South Africans.
- Ensure the ongoing collection of meteorological and ambient air quality data over South Africa and the surrounding southern oceans for use by current and future generations.
- Be the long-term custodian of a reliable national climatological and ambient air quality record.
- As the national meteorological service of the Republic of South Africa, fulfil the international obligations of Government under the Convention of the World Meteorological Organization.
- As the Aviation Meteorological Authority, fulfil the international obligations of Government under the Convention on International Civil Aviation.
- Provide services that are sensitive to the demographic realities of the country.
- Fulfil such other weather-related or ambient air quality information and international obligations as the Minister may direct.
- Be the custodian of the South African Air Quality Information System (SAAQIS).

7. ORGANISATIONAL STRUCTURE

Performance Information

PART B

Service Delivery Environment

The South African Weather Service is an ISO 9001 certified provider of meteorological services and the national provider of weather and climate-related information. The organisation is well positioned to contribute to socio-economic development and a prosperous and equitable society living in harmony with its natural resources. It provides reliable weather and climate information through its products and services and enables various sectors and communities to develop weather and climate risk mitigation strategies to reduce the impact of climate change and weather-related natural disasters.

Benefits derived from using SAWS products and services include:

- Safe, regular and efficient aviation operations, enabling ease of access to markets and various priority sectors such as tourism, etc.
- Risk management support for agriculture and fisheries, contributing to improvements in food security and the sustainability of rural livelihoods.
- Monitoring of water resources which enable shipping and other related blue economy activities.

Organisational Environment

The strategic intent of SAWS is the overarching goal of attaining a nation of 57 million people that are WeatherSMART through the provision of relevant meteorological products and services within an environment that needs to deal with the impacts of climate change and variability. The SAWS must comply with various regulatory frameworks, national and international priorities as well as increased competition at various levels. A volatile economy and aviation industry, challenges linked to service delivery, globalisation and WMO's Resolution 40, which requires global data sharing with other countries, could impact negatively on SAWS agility, competitiveness and sustainability. Risks that need to be managed also include infrastructure maintenance, financial sustainability, commercialising SAWS products and services, emerging competitors, the attraction and retention of critical and scarce skills, information and knowledge management, innovation and the safety and security of resources.

Key Policy Developments and Legislative Changes

The South African Weather Service Act, 2001 (No. 8 of 2001) as amended in 2013. During the period under review, no policy or legislative changes were implemented.

PERFORMANCE INFORMATION BY PROGRAMME

Programme 1: Weather and Climate Services

Purpose:
Safeguard Life and Property and Provide Meteorological Solutions to all South Africans

1.1 Warnings, alerts and advisories - Provide timeous and accurate impact based early warnings, alerts and advisories to safeguard life and property against the impact of severe weather on land, oceans and in the air

The SAWS continued with the maintenance and provision of five existing community segmented solutions and services as a critical part of the organisation's service delivery function. During the reporting period, five services that include; public weather forecasts, severe weather guidance maps, aviation and marine forecasts, historical weather and climate solutions, and the seasonal climate outlooks were provided. These solutions and services were disseminated to the media and general public through various platforms. The provision of these solutions and services for targeted communities directly supports the SAWS vision. A summary is provided below:

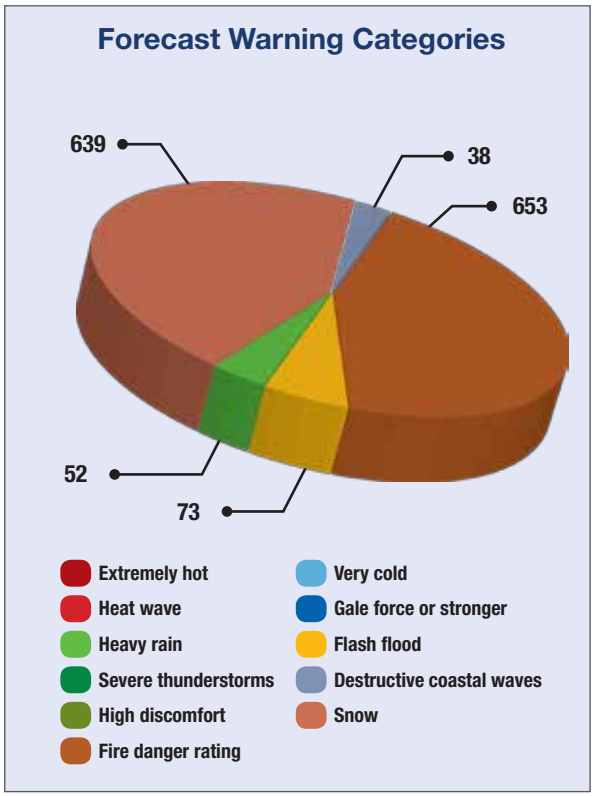
1.1.1 Public Weather Forecasts

The SAWS public weather forecasts being issued represents the core of the services being provided by the organisation. These solutions form the basis for dissemination utilising media such as radio, television, newspapers and others to reach the 57 million people of South Africa.

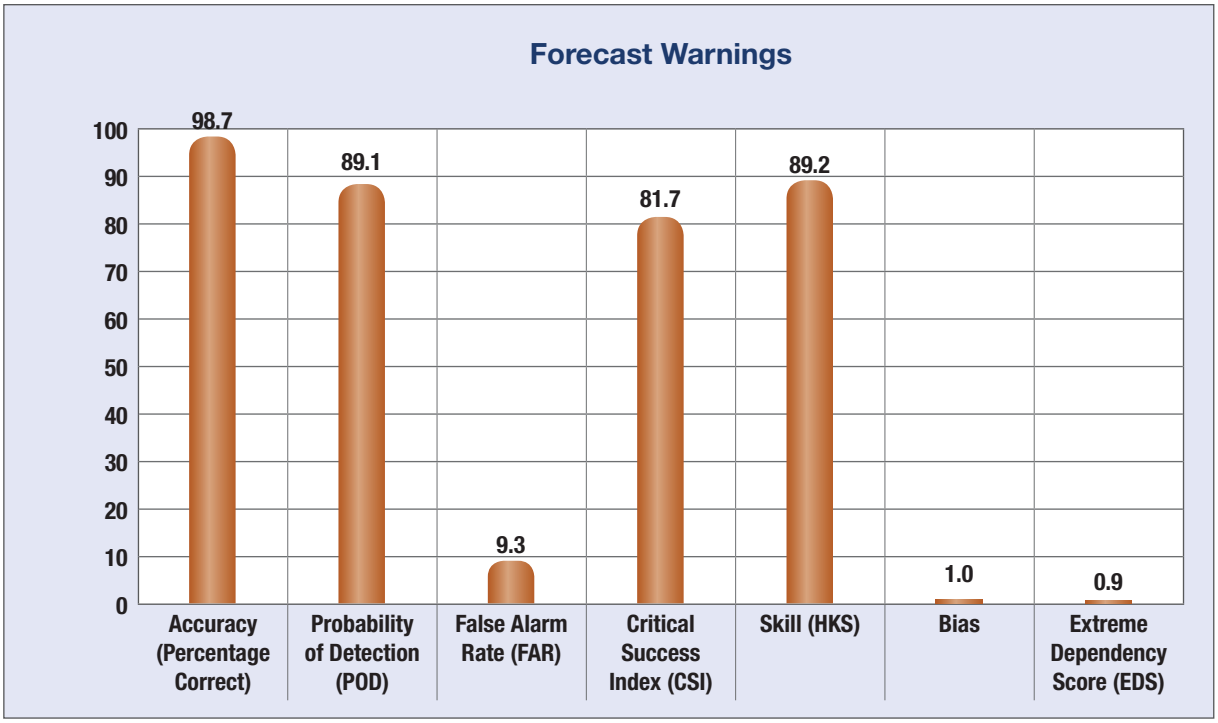
The public weather forecast service is supported through the development and dissemination of solutions that support and improve service delivery to the public sector. The solutions are maintained and operationally made available on the Forecaster web page at the following link: *http://cyclone-web.saws.co.za/fcastweb/fcastwebnfc.htm*. The monthly MREP-reports provide a summary of the services that were rendered during the reporting period.

1.1.2 Severe Weather Warnings

Severe Weather Warnings are issued in order to protect life and property as a result of severe weather that might endanger the safety of the public and infrastructure. For this purpose, SAWS utilises real time observation infrastructure such as weather radar, satellite images, lightning data as well as model output from short range numerical weather prediction models. SAWS issues warnings for a multiple range of weather hazards, including heavy rains, local flooding, strong winds, hail, etc. and has recently progressed into impact-based severe weather forecasting. Impact based forecasting relates to "what the weather will do" versus "what the weather will be". The monthly MREP-reports provide a summary of the number and nature of severe weather warnings that were issued during the reporting period.



Graph 1: Forecast Warning Categories.



Graph 2: Forecast Warnings.

During the year under review, the organisation issued 1 455 severe-weather warnings of which the major part was for high fire-danger ratings with 653 alerts, and severe thunderstorms at 639 alerts. These were sent with an accuracy of 97% against the targets of 95%; probability of detection of 89.1% against a target of 80%; and a false alarm rate of only 9.3% against a target of <20.

1.1.3 Aviation and Marine Forecast Solutions and Services

Aviation Forecasts

Aviation Forecasts are conducted by the Aviation Forecasting Centre based at OR Tambo International Airport. Warnings for different categories of severe weather impacting on the aviation industry are issued in order to contribute towards flight safety and enhanced efficiency in aerodrome operations.

Marine Forecasts

The organisation provides marine forecasts and warnings for METAREA VII, the second largest METAREA in the world, after the USA. The SAWS provides Safety of Life at Sea (SOLAS) solutions for the coastal as well as deep-sea areas of METAREA VII.

Historical weather and climate solutions

The SAWS delivers and maintains near real-time data reports routinely on a monthly basis. Publications of near real-time data reports on a daily as well as a 10-daily basis are also issued. Reports published on a monthly basis include:

- Climate Summaries of South Africa
- Drought Monitoring Reports
- Monthly Rainfall Reports

1.1.4 Seasonal Climate Outlooks

The Seasonal Climate Outlook which provides outlooks for a 6-month period on rainfall, minimum temperatures and maximum temperatures is maintained and provided on a monthly basis. The seasonal climate outlook updates were issued on a monthly basis through the monthly "Seasonal Climate Watch" Forums. SAWS also participated in the National Agro-meteorological Committee (NAC) meetings, which is a committee that prepares and provides an early warning through a national advisory to the agricultural sector. The seasonal climate outlooks form the basis for the NAC Agricultural Advisory.

1.1.5 Severe weather events during the report period

The World Economic Forum Global Risk Landscape for 2019 indicated that extreme weather events, natural disasters, water crises and the failure of climate-change mitigation and adaptation pose some of the biggest risks to humanity. This was very evident in the report period over South Africa, with a number of severe weather events that were experienced.

South Africa is a signatory to the Sendai Framework on Disaster Risk Reduction, and the SAWS plays a critical role in the country to achieve most of the goals of the Framework.

Of critical importance is the goal that focuses on early warning systems aiming to **substantially increase the availability of and access to multihazard early warning systems and disaster risk information and assessments to the people by 2030.**

The organisation was able to showcase its ability to warn the public and disaster management authorities of these expected conditions. These included the following:

Cut-off low 21 to 23 April 2019

Cut-off lows are one of the major rain-producing systems in South Africa. They frequent the country mostly in autumn and spring, but their highest frequency of occurring is normally in April. A deep cut-off low developed on the evening of Sunday, 21 April over the western parts of the country. What was unique about this system is that it was slow moving, which resulted in significant amounts of rain over the country. It then moved over the south eastern parts of the country by the following day, resulting in heavy rain, particularly in the Eastern Cape and KwaZulu-Natal, until 24 April. Over 200 mm of rainfall was reported in places along the coast, with over 70 mm reported in one hour in Port Edward.

This event resulted in a reported loss of at least 80 human lives, many communities being displaced, settlements being destroyed, mudslides and numerous motor vehicle accidents. The total cost of damage was estimated to be well over R 1 billion.

In fulfilling its mandate as the only authoritative voice for severe weather warnings, the South African Weather Service issued a media release on 20 April 2019. Emphasis was also placed on the fact that, it being a long weekend, there would be a lot of people on the roads, which meant heightened levels of exposure to the elements.

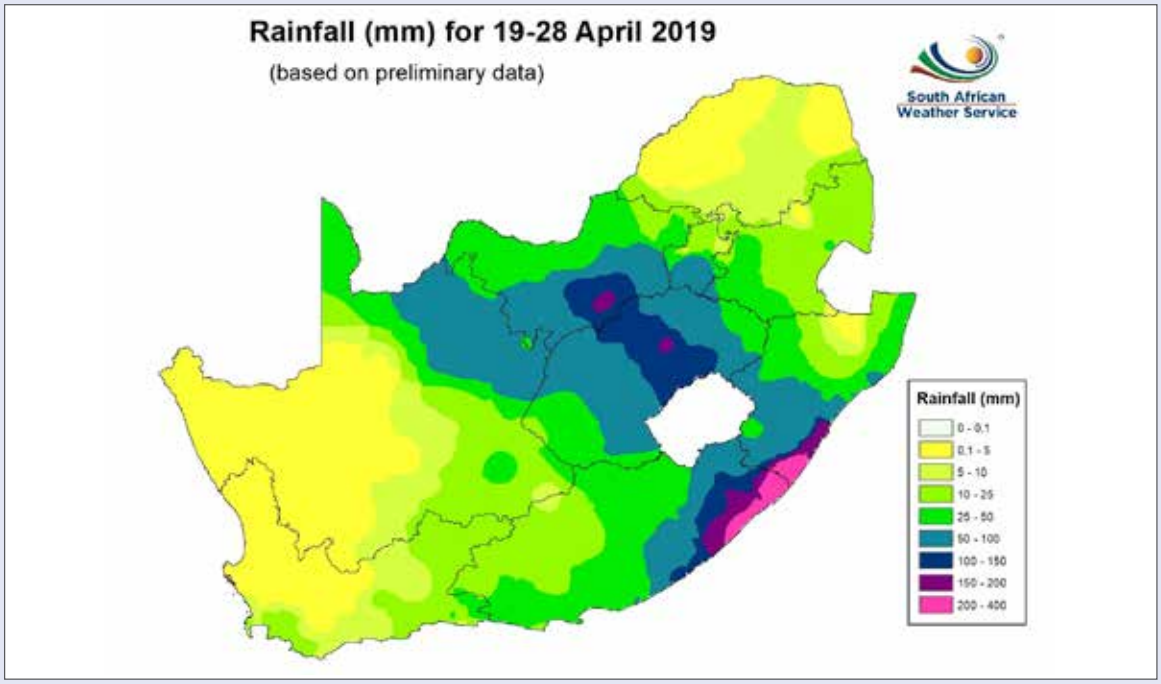


Figure 1: Accumulated rainfall for a 10-day period of 19 to 28 April 2019.

Figure 2: On the left, a collapsed house due to a mudslide along the coast, and on the right, an aerial view of flooded Amanzimtoti on 23 April 2019 (News24).

Winter storm in Western Cape 21 to 23 June 2019

An intense cold front associated with a cut-off low moved over the Western Cape during the late afternoon of 21 June 2019. What made this cold front so unique and intense was that the central position of the low pressure passed uncommonly close to the South African coast. This resulted in extreme wind conditions ahead of the cold front over the Western, Northern and Eastern Cape as well as off the south-west coast and later south coast. Heavy downpours were experienced during the afternoon and into the next morning, which led to flooding and flash flooding in areas.

Also associated with this front were high sea conditions and storm surge. Significant wave heights between 6 and 9 m were experienced along the Western Cape south-west coast during the night of the 21st into the morning of the 22nd June and spreading along the south coast. Furthermore, as a result of the strong winds "pushing" water further up onto the beachfronts, it was likely to result in storm surge.

An outstanding fact about this storm was that it occurred during "mid-winter" on the winter solstice and this is the time for spring tide, when the high tides are higher than normal. Therefore, this resulted in particularly perilous conditions.

The South African Weather Service issued a media release on 19 June, alerting the public about the expected extreme weather as well as the likely impacts, which included mudslides, rock falls and the uprooting of trees.

These impacts were confirmed in media and disaster management reports.

Figure 3: Image above (top) shows an uprooted tree that fell over a fence in Somerset West, and (below) the Franschhoek Pass where rock fell into the road (Storm Report) (bottom image).

Severe thunderstorm outbreaks in KwaZulu-Natal, October, November and December 2019

The months of October, November and December 2019 saw a period of numerous occurrences of severe storms over the summer rainfall areas. They were concentrated mainly in KwaZulu-Natal, where an unprecedented number of tornadoes were observed during this period. The tornadoes caused loss of human lives as well as extensive damage to housing and other infrastructure.

Of most interest was the devastating tornado that occurred on 12 November 2019 at the Empolweni settlement near the town of New Hanover, where, according to reports, there were sadly two human lives that were lost. There was also clear evidence of massive destruction as most of the houses in the settlement were severely damaged.

The potential for severe weather on this day was identified by the forecasters at SAWS and a severe weather watch for severe thunderstorms in KwaZulu-Natal was issued on the morning of 12 November 2019. This was upgraded to a warning later that day for selected local municipalities.

As is standard practice in other countries, SAWS issues alerts and warnings for severe thunderstorms that could lead to tornadoes, but not for individual tornadoes. There is, however, work planned to indicate the possibility of the occurrence of tornadoes in warnings in future.

In addition to that, SAWS regularly participates in outreach activities aimed at educating the public on the appropriate precautions to take during severe weather events.

The SAWS also aims to increase the reach of its warning service by partnering with other stakeholders in order to be able to reach all of South Africa's population.

Heavy rains leading to flooding in the north-eastern parts, December 2019

During the final week of November 2019 and the beginning of December 2019, heat wave conditions were experienced over several of the central provinces, namely Gauteng, North West, the Free State, Northern Cape, Mpumalanga and Limpopo.

From 3 to 4 December 2019, a significant change in the weather was anticipated, with a ridging surface high pressure system expected to introduce much-needed cooling over the eastern and central parts of the country. Concurrent to this, the presence of an upper-air trough over the central interior was expected to enhance both the likelihood as well as quantity of rainfall over some of the central provinces from 2 to 5 December. This expectation was confirmed by the SAWS Numeric Weather Prediction (NWP) models and prompted the issuing of a media release on 3 December 2019. Heavy rainfall, as well as localised flooding, was expected over Gauteng, the northern Free State, as well as parts of the North West province. As can be seen from figure 4 below, most of the rain was experienced over the northern portion of Gauteng and some areas in Mpumalanga. This resulted in severe flooding in places over the City of Tshwane.

Figure 4: Flooded Centurion Hotel the morning of 9 December 2019 (SABC News Online – Twitter).

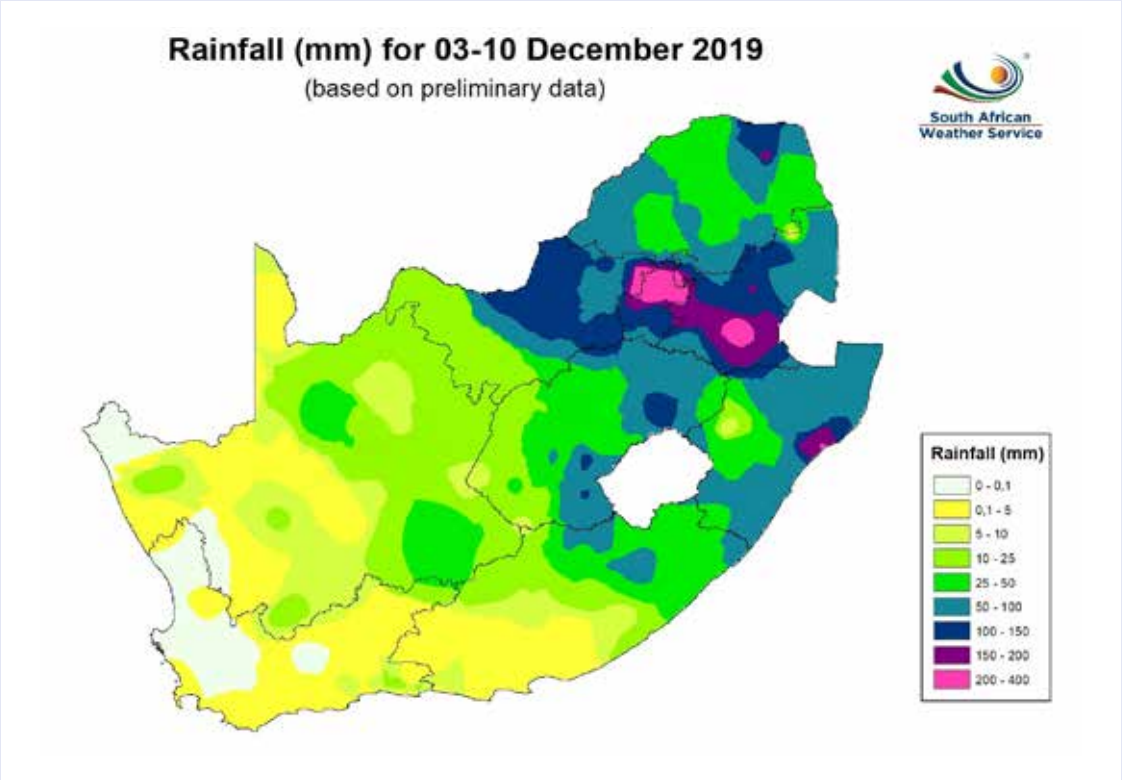


Figure 5: Total rainfall for 3 to 9 December 2019 over the RSA (Climate Service).

Figure 6: Flooding in Mamelodi East, Tshwane.

Impact-based forecasting

Since 2015/16, SAWS, in close collaboration with the National Disaster Management Centre (NDMC), had been working on developing and implementing an Impact-Based (ImpB) Severe Weather-Warning System (SWWS) for South Africa. In line with international trends in meteorology and weather forecasting, the impact-based severe weather warning approach sees a departure from the traditional *threshold-based approach* and focusses strongly on the *socio-economic and physical impact* that a severe or extreme-weather system will have on the human population as well as on the environment, including the built environment. In other words, the purpose of the project is to move from "what the weather will be" to "what the weather will do".

During the period under review the Impact-Based Severe Weather Warning System pilot phase continued across the country. This was run in collaboration with disaster management centres in all the provinces and was used to test the new warnings.

SAWS Disaster Risk Reduction (DRR) regional responsibilities

Goal target (f) of the Sendai Framework for Disaster Risk Reduction is to **substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030.**

As part of its regional responsibilities, SAWS contributes through its designation as a Regional Specialised Meteorological Centre. This is carried out in two programmes, namely the Severe Weather Forecasting Programme (SWFP) and the Southern African Regional Flash Flood Guidance System (SARFFGS).

Globally, the SWFP currently involves over 75 developing, least developed and small island countries on three continents.

In October 2019, SAWS hosted and chaired the meeting of the Steering Group for SFWP to pave the way for the sustainability of the programme, while also disseminating it to other parts of the world.

The SARFFGS Steering Committee meeting was also hosted and chaired by SAWS in December 2019, aimed at developing and implementing system enhancements in the next phase of the programme.

Following the roadmap for implementation of enhancements to the SARFFGS, the initial Radar Planning Meeting was hosted by South Africa, from 23 to 24 January 2020. The objectives of this meeting were to review radar data availability and the quality thereof for the region.

1.2 Climate services - Provide climate information and services in support of national mitigation and adaption efforts

During the period under review, new solutions were developed for the climate sensitive sectors of the economy as a direct response to identified user needs. Two heat stress indices were developed, namely (a) the Temperature Humidity Index (THI) and (b) Enthalpy.

The THI is a commonly used index and is proven to be a useful tool to estimate livestock productivity response as a function of climate. The THI is a measure that accounts for the combined effects of environmental temperature and relative humidity on livestock to assess the risk of heat stress and prevent major effects. It is particularly important for dairy farming since milk-producing cattle are extremely sensitive to heat stress. The second index is Enthalpy, which is used to measure thermal comfort and heat stress for poultry. Enthalpy is defined as the total heat content of air and serves as a key indicator for heat stress in poultry. Enthalpy is calculated using variables such as temperature and relative humidity. The THI and Enthalpy forecast product will be used to manage and minimize the negative effects of heat stress on livestock. The UM model (SA4 domain) hourly forecasts of air temperature and relative humidity with a lead-time of 72-hours are used for the THI and Enthalpy forecasts. The system will be updated every 48-hours, producing THI and Enthalpy forecasts for livestock and poultry.

The heat stress index products for livestock were developed, tested and validated during the year under review. Extreme heat can cause heat stress and sub-optimal livestock performance, which has a negative impact on animal productivity. Heat Stress is a major source of production losses in the dairy, beef, and poultry industries. The negative impacts of heat stress on livestock can be alleviated with the implementation of appropriate mitigation strategies to maintain productivity during times of high thermal heat loads and recovery after heat stress. One of the mitigating strategies is the use of heat stress forecasts to respond appropriately (e.g. use of cooling technologies) and reduce the impact of heat stress on livestock.

1.2.1 Provision of Meteorological Service to National and International Air Navigation

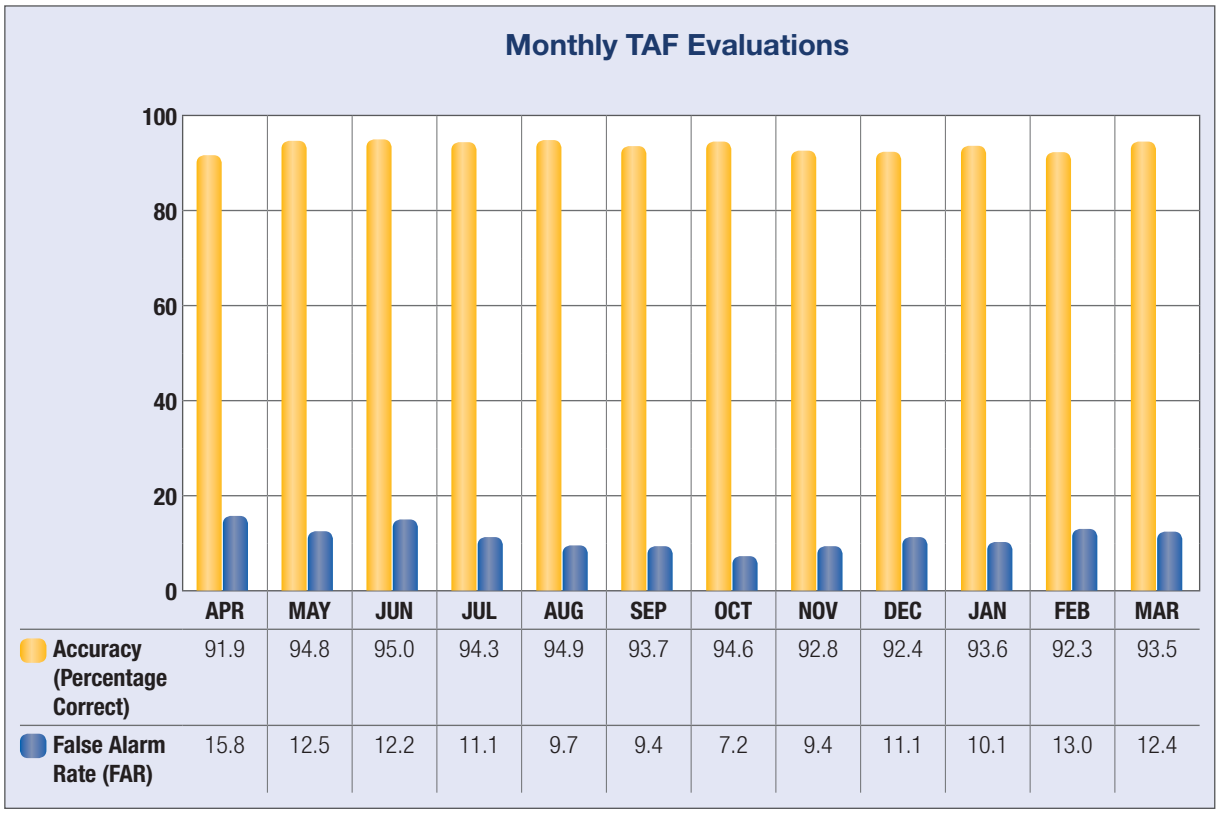
The South African Weather Service (SAWS) is the designated aeronautical meteorological authority for South Africa. This means that SAWS is responsible for providing meteorological services for international and domestic civil air navigation in accordance with applicable standards at international and national level. In addition, SAWS must ensure that it fulfils the requirements of the World Meteorological Organization (WMO) in terms of the competencies of its technical personnel providing aeronautical meteorological services on its behalf. These measures are intended to ensure that the services provided to the aviation industry are accurate and timely and therefore assist the aviation industry to perform their activities in a safe and timely manner.

To comply with WMO competency requirements, SAWS implemented competency assessment programmes to assess and monitor competencies of its technical personnel providing services to the aviation industry. During the period under review, 95% of Aeronautical Meteorological Forecasters (AMF) and 97% of Aeronautical Meteorological Observers (AMO) were competent in all competency criteria. Only 5% of Aeronautical Meteorological forecasters and 3% of Aeronautical Meteorological Observers remained with few criteria to address.

Percentage Accuracy for Terminal Aerodrome Forecast (TAF)

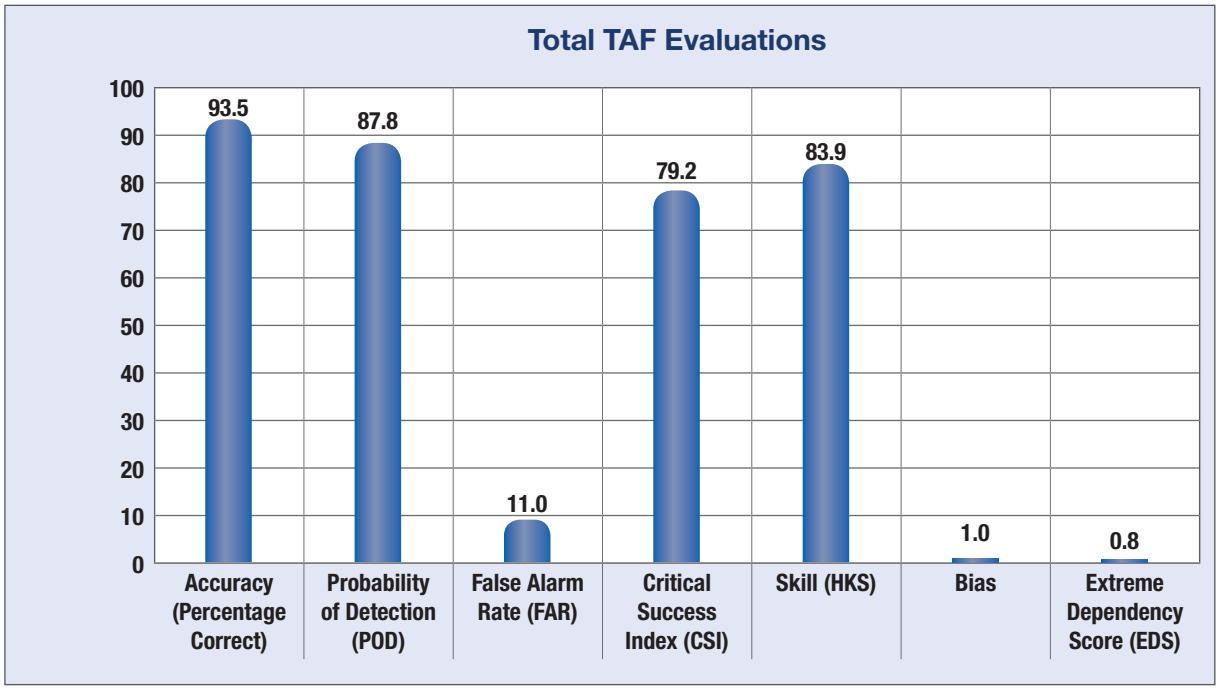
The Terminal Aerodrome Forecast (TAF) is a forecast product which predicts meteorological phenomena at a particular aerodrome for up to a day in advance. The product provides the aviation industry with information regarding weather conditions at a particular aerodrome so as to enable them to plan their operations. The accuracy of this product is therefore critical for the aviation industry because the industry uses this information to determine, amongst others, the amount of load they can put on an aircraft based on the expected weather conditions at their destination airport.

During the year under review, SAWS achieved an accuracy of 93.5%, which exceeded the required 90% operational desirable accuracy of the terminal aerodrome forecast. This achievement places SAWS amongst the best National Meteorological Services (NMSs) in terms of the quality of its Aeronautical Meteorological products. The graph below indicates the evaluated national percentage accuracy for Terminal Aerodrome Forecasts (TAFs).



	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Accuracy (Percentage Correct)	91.9	94.8	95.0	94.3	94.9	93.7	94.6	92.8	92.4	93.6	92.3	93.5
False Alarm Rate (FAR)	15.8	12.5	12.2	11.1	9.7	9.4	7.2	9.4	11.1	10.1	13.0	12.4

Graph 3: Monthly TAF evaluations.



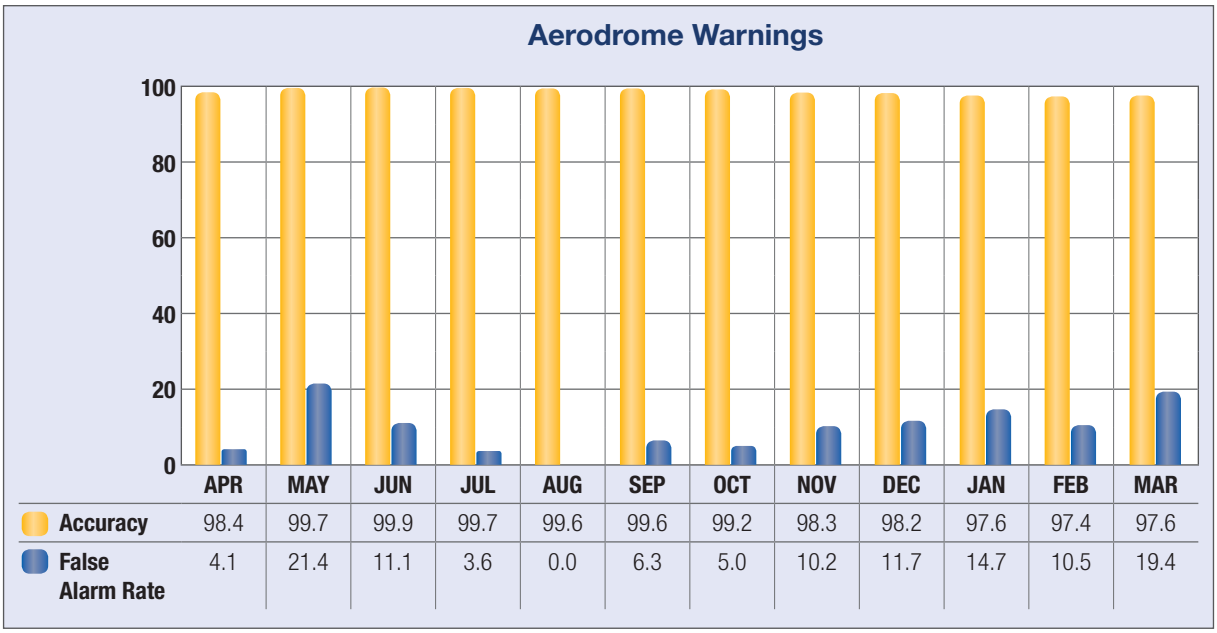
Graph 4: Total TAF evaluations.

The graph above indicates the achieved national targets for the scheduled TAF.

Percentage of Aerodrome Warnings

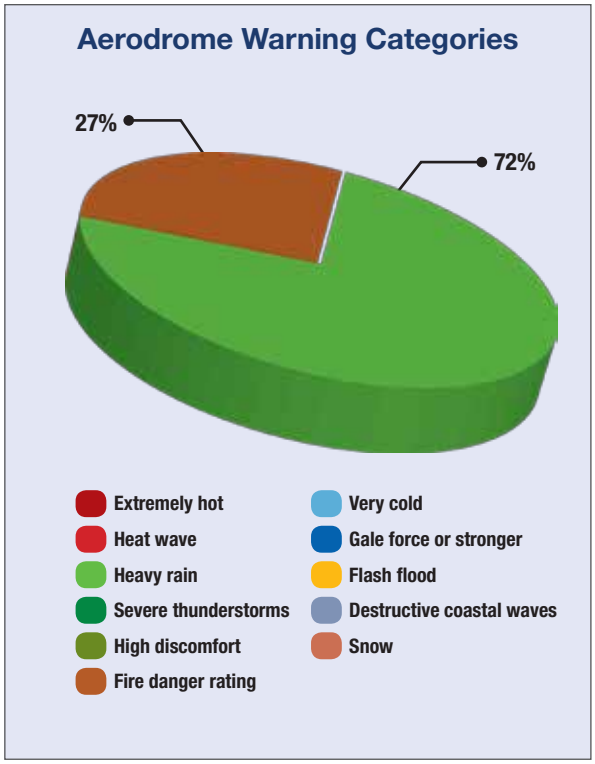
Aerodrome warnings provide concise information of meteorological conditions that could affect aircraft adversely, including parked aircraft. During the year under review, 642 aerodrome warnings were issued nationally, covering all the major airports in the country. An accuracy of 97% was achieved against the Annual Performance Plan (APP) target of 98%.

The SAWS issues aerodrome warnings for various weather phenomena affecting airport operations as indicated on the pie chart in graph 6. Most of the aerodrome warnings (72%) were for thunderstorms, 27% for strong winds which impacted on operations at the various airports, while other weather phenomena were experienced least.



	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Accuracy	98.4	99.7	99.9	99.7	99.6	99.6	99.2	98.3	98.2	97.6	97.4	97.6
False Alarm Rate	4.1	21.4	11.1	3.6	0.0	6.3	5.0	10.2	11.7	14.7	10.5	19.4

Graph 5: Aerodrome Warnings.



Graph 6: Aerodrome warning categories.

Airport Collaborative Decision-Making (A-CDM)

A-CDM is a collaborative initiative amongst various stakeholders at a particular airport such as airport operators, aircraft operators, ground handlers and air traffic controllers. SAWS is part of this initiative which aims to improve the efficiency and resilience of airport operations by optimising the use of resources and improving the predictability of air traffic. This is achieved by encouraging the relevant stakeholders to work more transparently and collaboratively, exchanging relevant accurate and timely information. The focus is especially on aircraft turn-round and pre-departure processes.

SAWS' contribution is to advise the Airport Management Centre (AMC) in attempting to minimize weather related disruptions and delays at O.R. Tambo International airport. In order to consistently reduce these impacts, the AWC has involved the nowcasting research team to mitigate solutions that can aid in timely weather forecasts. Thunderstorms are a great concern to the aviation industry as they tend to have hazardous phenomena such as, but not limited to lightning, icing and fog. Understanding the timing of thunderstorms is an ongoing research question to this day. Nowcasting tools have aided in forecasting onset time and decay time. The importance of timing is mainly for planning purposes, especially in an industry that may feel the financial costs if planning does not materialise.

The Thunderstorm Table (TT) developed under the Aviation Research Demonstration project (AvRDP) and used for aviation, proved very useful on 20 and 21 November 2019, where thunderstorms that impacted operations over the airport were managed excellently using this tool. The TT, along with other tools, helped in issuing early warnings for both days and this was greatly appreciated by the AMC management. The TT was rolled out to other major airports to initiate their own investigation on the performance of the short-term and long-term forecasting models.

Aviation Stakeholder Engagements

The SAWS hosted the quarterly Advisory Committee on Aeronautical Meteorological Services (ACAMS) which is a platform for the aviation industry and SAWS to discuss issues regarding aeronautical meteorological service provision. The committee comprised stakeholders representing airlines, SACAA, ATNS, SAAF, ACSA and recreational aviation. ACAMS is a prime consultative stakeholder engagement forum between SAWS and the aviation industry. This is where the aviation value chain begins by sourcing customer needs, creating products and services based on those needs, as well as reporting back on performance targets. The AASA representative in one of these meetings congratulated SAWS on its achievements with regards to the aviation forecast accuracies.

A concern raised by one of the commercial airlines in this forum was the diversion of several aircraft which could not land at the Cape Town International Airport due to a rare fog event on the ground. As guided by the Numerical Models, the aerodrome forecast on the day was indicating clear conditions. These interactions between SAWS and Aviation proved to be very valuable as we were able to assess the value of these services together with the industry.

The organisation is also part of the Local Runway Safety Team meetings which is hosted by the Airports Company South Africa (ACSA). This forum discusses issues relating to safety of aircraft on the runway during landing and taking off. The incidences induced by the condition of the runway, wind-shear and weather-related diversions were discussed in order to establish preventative measures.

A meeting with the Airports Company of South Africa (ACSA) on 19 September 2019 addressed enhancing Aerodrome-Collaborative Decision Making (A-CDM) during inclement weather conditions that affect operations at OR Tambo International Airport.

Some of the topics discussed included:

- Developing and encouraging clear communication lines between SAWS and AMC representatives (especially handlers from Airlines);
- Air Traffic Navigational Services (ATNS), Centralised Airspace Management Unit (CAMU) and the need for constant communication during adverse weather conditions (currently or expected);
- Clarification on ATNS declaring Instrument Meteorological Conditions (IMC) for a particular airport without consulting the weather people. IMC is an aviation flight category that describes weather conditions that require pilots to fly primarily by reference to instruments, and therefore under Instrument Flight Rules (IFR), rather than by outside visual references under Visual Flight Rules (VFR).

The Airlines Association of Southern Africa (AASA) business meetings are held on a quarterly basis, focusing on understanding user requirements and meeting clients' needs. During the year under review, only three of these meetings were held instead of four, due to the COVID-19 global pandemic that saw most planned activities being cancelled in an effort to minimize the transmission of infections. It is in these meetings where the agreed cost-recovery tariffs were also communicated to the aviation industry.

The 2019 Airlines Association of Southern Africa Annual General Assembly (AASA AGA) was held from 10 to 13 October 2019 in Saint Gilles Les Bains, Réunion. The AASA AGA focuses mainly on working together with leaders of the aviation industry and senior public and government officials on matters of policy, legislation, regulation, planning, operational efficiency, safety, security and finance, affecting the overall profitability of the airlines and their continued sustainability.

The host for this year's event was Air Austral, an airline at Roland Garros Airport, Reunion. The SAWS, as an associate member, was represented by the acting CEO with the idea of engaging stakeholders on strategic and impactful engagements on current and emerging issues affecting the aviation sector across the board. SAWS was also a sponsor to this event.

The Commercial Aviation Association of Southern Africa (CAASA) – one of our clients – hosted a commercial aviation symposium Africa from 26 to 27 September 2019 in Stellenbosch. CAASA was also celebrating 75 years of its existence, and the theme for this year was "Fly Africa, Grow Africa".

Some of the topics covered during the symposium included:

- Aviation partnerships in Africa
- Commercial aviation economic overview
- Growth in African Aviation
- Innovation and technology trends revolutionising the aviation industry
- The future of chartering in Africa
- Airline pilot training challenges and opportunities
- Development of South Africa's airports

African-Indian Ocean Planning and implementation Regional Group (APIRG) and Regional Aviation Safety Group (RASG)

An APIRG and RASG-AFI meeting was held in Ghana, Accra, Movenpic Hotel from 29 July to 2 August 2019. The meeting deliberated on the Decisions and Conclusions that will not only spur aviation safety in the Africa and Indian Ocean ICAO (AFI ICAO) Region, but will also provide a framework for international discourse and adoption into various ICAO standards, recommended practices, policies and guidelines. The meeting further appealed for a concerted effort by all aviation stakeholders to create system-wide comprehensive levels of Effective Implementations (EIs) of the resolutions of ICAO bodies and to ensure compliance in the interest of safer African skies. The SAWS continued to participate meaningfully to APIRG and was appreciated for keeping the aeronautical Meteorology flag flying high.

SADC Civil Aviation Committee

The SAWS participated in the 22nd meeting of the SADC Civil Aviation Committee (SADC CAC) which took place from 3 to 5 July 2019 in Victoria, Mahe, Seychelles. This meeting was preceded by the meeting of the SADC Technical Committee on Civil Aviation Upper Airspace Management Centre which took place on 1 and 2 July

2019 at the same venue. In terms of the SADC protocol on Transport, Communications and Meteorology, the SADC Civil Aviation Committee is responsible for reviewing the status of implementation of the SADC air transport policies and strategies and also recommends policies and programmes for consideration by the committee of senior officials responsible for Transport.

International Civil Aviation Organization 40th Assembly

The SAWS took part on the ICAO 40th Assembly that was held in Montreal, Canada from 24 September to 4 October 2019. A SAWS delegate attended the Assembly for the first week, to minimise the impact on the SAWS international travel budget. In air navigation and aviation safety there continues to be overwhelming support for the strategic direction offered by the GANP and GASP. Some concerns were expressed in terms of implementation and the ability of States, in particular the least developed countries and countries with economies in transition, to meet the ambitious objectives and timelines set forth in the GANP/ASBUs.

A significant discussion took place on technical issues regarding space weather and climate change, while continued efforts to reduce the impacts of aviation on the environment through schemes such as CORSIA (Carbon Offsetting and Reduction Scheme in International Aviation) were deliberated on. Views were shared on specific aspects of CORSIA and other efforts to reduce carbon emissions, as well as minimise noise and air pollution on the impacts of climate change on aviation.

South African delegation at ICAO 40th Assembly.

Safety campaigns

As part of SAWS' contribution to the Civil Aviation Safety Campaign, our forecasters presented at two flying clubs, namely Robertson Flying Club on 20 November 2019 and Stellenbosch Flying Club on 21 November 2019. The main topics covered were about aviation-related weather hazards that have a direct impact on the safety of aircraft and occupants. These included but were not limited to:

- Turbulence;
- Icing;
- Reduced Visibility;
- Surface Contamination;
- Wind Velocity;
- Precipitation; and
- Lightning.

Forecasting presentations to pilots during the Civil Aviation Safety Campaign.

South African Civil Aviation Industry Awards

The SAWS was invited to participate in the second Civil Aviation Industry Awards ceremony, hosted by SACAA on 13 December 2019 at CSIR International Conference Centre. SACAA is the regulator responsible for safety oversight for the Aviation industry/activities within the South African Airspace and, as such, they also carry the mandate to promulgate civil aviation regulations and technical standards which enable them to perform their functions. As the organisation that provides a valuable service to the aviation industry, SAWS was invited to grace the occasion by attending the event. SAWS was also one of the nominees who would potentially receive the award since it had submitted entries under three different categories; which were:

a) Aviation Research and Development
b) Aviation Training and
c) Aviation Professional

The purpose of the awards was to acknowledge and celebrate the South African aviation safety record which is the envy of the world. This was an exemplary practice by various individuals and organisations in the critical areas of aviation safety, security, transformation and innovation, among others. SAWS had the opportunity to demonstrate excellence to its peer group and clients and be celebrated as an industry leader for its contribution towards keeping the aviation industry safe. SAWS did excellently on two of the three categories that they have entered wherein they became the item winner for the Aviation Professional category and the runner-up on the Aviation Research and development category. Ms Gaborekwe Khambule received the award under the Aviation Professional category for 2019 for the contribution she made to aviation in South Africa and her role globally. Mr Morné Gijben received the runner-up award for the Aviation Research Demonstration Project.

SAWS representatives who attended the event

Aviation Research Development Project

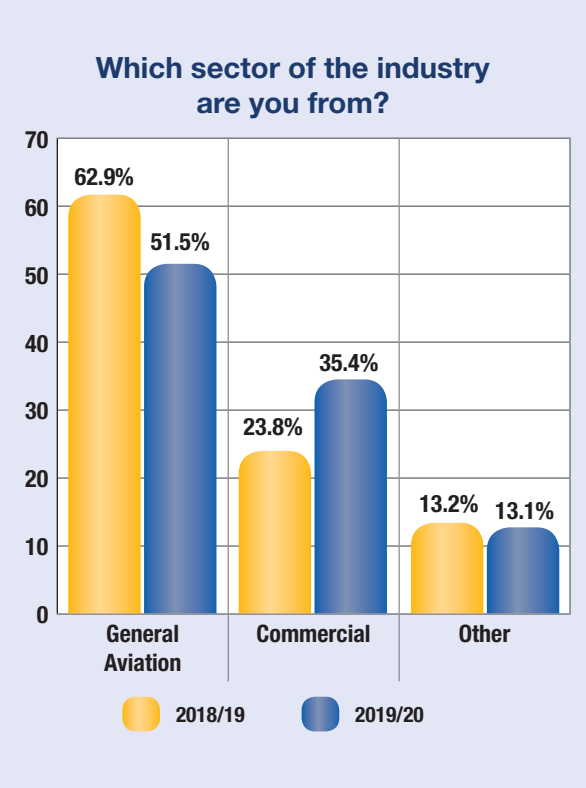
The SAWS successfully hosted the Joint CAS/CAeM AvRDP SSC and EN-MHS/1 Meeting cum Aviation Seminar from 19 to 23 August 2019. The seminar took place in Pretoria, South Africa. The purpose of the seminar was to enable National Meteorological Services who are taking part in the WMO CAeM AvRDP project, to show-case the outcome of the research that they have been busy with in support of Aviation Meteorology. The research conducted included meteorological information supporting automated decision processes or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.

Aviation Perception Survey

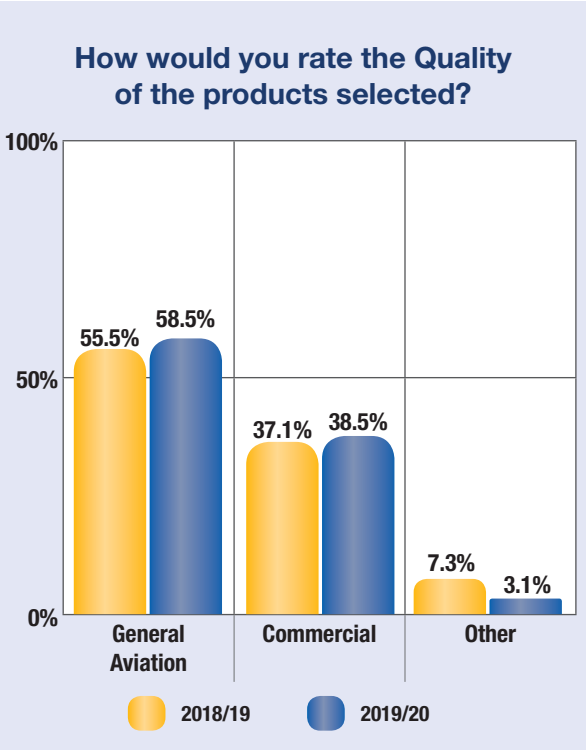
The Aviation Weather Centre was in frequent contact with all stakeholders through ACAMS and SACAA-organised safety campaigns, as well as on ad-hoc bases. This is a basic requirement as aeronautical meteorological services continued to evolve to meet customer requirements.

During the year under review, stakeholders were requested to post their responses to a perception survey on the aviation website and customer satisfaction was gauged from there. Ten questions were asked, ranging from the user category, quality of the services, value for money etc. The full results of the survey are available on the aviation web. Results for the previous survey are included for comparison. Out of the 260 participants who took part in the survey, 51.1% worked in the general aviation sector, 35.4% worked in the commercial aviation sector and 13.1% worked in other associated sectors.

Asked to rate the quality of the products they made use of, 58.5% felt the product quality offered by SAWS was good, while 38.5% felt the quality was excellent. A small percentage (3.1%) rated the quality as poor. See graphs 7 and 8 overleaf.



Graph 7: Sectors in the Aviation Perception Survey.



Graph 8: Ratings of the quality of products selected.

1.2.2 Climate Services

With the climate changing and an increasing frequency and intensity of disasters such as floods and droughts, it is becoming more crucial to provide climate information and associated services to individuals and organisations to help them make better decisions and become more climate resilient. Two new climate information products were introduced i.e. Annual State of the Climate and WMO Extreme Climate Indices which together provide a comprehensive overview of the climate of South Africa during 2019, compared to previous years. The aim is to provide an analysis of national temperatures and precipitation during 2019, placing it in a historical context as well as an update on global climate indicators. In addition, notable climate events and trends are discussed. Both these reports provide authoritative information for policymakers and are publicly available online on the SAWS webpage and the National Climate Change Information System. Some of the main conclusions from the results of the analyses contained in the reports are the following:

- For surface temperature there is a general warming trend over South Africa over the period 1931 – present. Annual maximum temperatures are showing an increase in especially the western half of the country, while annual highest daily minimum temperatures are showing significant increases, especially along the coast and parts of the northern interior. The lowest minimum temperature per year shows significant increases almost countrywide. Generally, cool days are decreasing and hot days increasing. Similarly, cold nights are decreasing and warm nights increasing, but not significantly in the central interior. However, the annual maximum warm spells have increased significantly over the western and central interior. In contrast, the maximum annual cold spell lengths have decreased countrywide.

- Compared with surface temperature, where all the extreme indices can be linked to a general warming trend, mixed trends are presented by the trends in extreme rainfall indices analysed over the period 1921 to 2019. Most indices can be associated with a decreasing trend in annual rainfall in isolated regions in the eastern and far northern interior, with weaker drying signals in the south-west, while increases in rainfall are shown in the southern interior. The annual maximum daily and five-daily rainfalls show significant increases in the central and southern interior. Trends in the intensity

of rainfall on rainy days show mixed signals, but there are clear decreases in the far north-eastern interior and increases in the central and south-eastern parts. Trends in days with daily rainfall above the specific thresholds of 10 mm and 20 mm mostly indicate increases in the western and southern interior and decreases in the east and north-east. However, in the case of the 25 mm threshold, increases are apparent over the central and southern interior and spreading eastwards, while decreases are only apparent in the far north. The annual maximum dry spells are increasing over most of the summer rainfall areas but decreasing in the south-western interior, which can indicate that winter rainfalls in the regions with predominantly summer rainfall are diminishing. The annual maximum spells of wet days are decreasing in the north-eastern half of South Africa but there are signals of significant increases in the south-eastern interior. There are also indications that in general, over most of South Africa, daily rainfalls that are considered to be relatively high are increasing.

A prerequisite for delivering weather and climate information services is good observational networks to provide data. The availability of quality-controlled climate data from the AWS and ARS network was 92% and 90% respectively, exceeding the annual targets set. This was largely due to the dedication of Regional Offices in getting stations up and running within time periods that allowed for minimum downtime of instrumentation. An injection of replacement sensors into the network during the later period of the year helped to ensure that the weather stations continued to operate at a level that enabled quality data to be gathered and sent through to the main database. The data collected enabled SAWS to provide a number of products freely available on the SAWS website as well as for dissemination to students for educational purposes.

A growing concern that extends beyond SAWS, is the deteriorating public good weather and climate observation infrastructure in the country as a whole. The observation infrastructure in South Africa is owned and managed by several institutions, including SAWS, but the number of stations is declining, some of the existing infrastructure is not optimally maintained and common methods of observation and quality control measures are lacking. Furthermore, the current South African observation-based data systems are facing gaps with regard to coverage over land and the oceans. These challenges affect the quality of the data collected and subsequently, the quality of weather forecast products, and have an impact on monitoring climate change, which must be continuous, consistent and long-term. In the light of increasing constraints on capacity and resources, the development of environmental monitoring infrastructure and data management initiatives that support the rolling out of country-level climate services, must be done in a more integrated way. During the past year, funding was obtained from GIZ to conduct a study to explore the possible funding options/models for maintaining and enhancing public good weather and climate observation infrastructure. Commissioning of the study to a suitable service provider will commence in the next financial year. This work will inform the national data infrastructure indaba being planned with key stakeholders.

Through an initiative under the auspices of the National Framework for Climate Services (NFCS), a climate services portal has been developed on the DEFF National Climate Change Information System website in order to make all climate service products available in one place, where it can be easily accessed, to serve as a “one-stop shop” for sharing climate information with South Africans of all walks of life using a variety of tools and approaches. As there are various climate service providers in the country, the coordination of climate services nationally will be better managed through an online portal with modern and effective information dissemination capabilities. The current plan of action is to start with products and services currently available at SAWS that can be disseminated online. If the climate information that a certain sector needs is not provided by the SAWS products and services or any of its partners that the request can be directed to, and will be used as input for possible development of future climate services offerings.

Of further importance is whether information is communicated to users in a form that they can understand and relate to. Several years ago, the language barrier was identified to negatively influence effective communication of weather and climate information in that it was only available in one official national language. To bridge the linguistic barrier, SAWS worked in collaboration with the Department of Arts and Culture and the Pan South African Language Board (PanSALB) to develop the Atmospheric and Meteorological Terminology Book – which translates atmospheric and meteorological terminology into all official languages of South Africa. The process was twofold: (i) the terms were developed into

the local languages in conjunction with Department of Arts and Culture, (ii) verification and authentication of the terms developed were done by PanSALB, the organ of state mandated by an Act of Parliament to monitor language standards. While the project seeks to make it easy for people to interpret weather and climate information, and use it in their decision-making and preparedness, it also recognises the equal status of African languages as enshrined in the Constitution. The aim is to distribute the terminology book as widely as possible, so steps are being taken to publish the terms on the SAWS website and other digital platforms. Hard copy formats of the terminology publication will also be made available in the near future and disseminated through outreach events to local communities, to be able to access climate change information in their mother tongue and make informed choices.

1.2.3 Marine

Weather and climate solutions

The high-resolution wave and storm surge model (SWaSS) ws calibrated and validated in 2019/2020 and accepted within the academic community within a peer-reviewed publication. These models are a first for South Africa as no other entity has created, nor made operational, such a system. Following the development of these specialised marine products a Spring Tide Monitoring and Notification tool for the coastal forecasting offices was developed. This tool alerts the forecast desks and Disaster Management to enhanced possibilities of coastal inundation during spring tide conditions. The potential for generating revenue was explored, but challenges experienced with scientific computing infrastructure have slowed progress noticeably. In close collaboration with the SAWS ICT department these were partially resolved in the last quarter of 2019/2020, however it is clear that this is an area for future investment.

Research and development

The Marine Unit was engaged in research in the fields of safety at sea, coastal safety, sea ice charting, the enhancement of established high-resolution marine products, ocean observations (coastal, offshore and within the Southern Ocean) among others. Nine research papers were published in 2019, with more research papers in progress, in addition to papers having been submitted to journals for review.

Specialised marine forecasting products enable forecasters to warn the public of impending dangerous conditions.

Infrastructure

In-situ met-ocean data observations continue to improve our observations and climate database for the data sparse regions of the Southern Hemisphere and improve numerical weather and climate prediction models. Ongoing association with platforms such as the Data Buoy Cooperation Panel (DBCP), the newly renamed OceanOPS team (previously JCOMMOPS) under the Global Ocean Observing System (GOOS) allowed SAWS access to ocean observing technologies to enhance our ocean observations at little to no cost. In the past year, 23 drifting weather buoys and 13 Argo floats were deployed to increase the number of ocean observations available in the data-sparse ocean areas of the Southern Hemisphere. A combined proposal is under development by the South African Polar Research Infrastructure (SAPRI) initiative (funded by the European Union and Department of Science and Innovation) for submission to the SARIR (South African Research Infrastructure Roadmap) panel in September 2020 for approval and funding.

SAWS is the key partner for atmospheric measurements, including the Global Atmosphere Watch (GAW) programme. Observing platforms include meteorological observing stations on the island bases, Antarctica, research vessels, drifters, Argo floats as well as critical moored infrastructure.

Resources and stakeholder engagement

The Marine Unit maintained and further developed mutually-beneficial local, regional and international stakeholder relationships and initiated the development of two Memoranda of Understanding, while a scientist was nominated as the METAREA VII Coordinator. The Unit continued to build its resources and stakeholder network. This was done by attending workshops and conferences of the Argo Steering Team (AST) for Argo float deployment strategies, the Nansen-Tutu Centre for Marine Environmental Research, the post-graduate-led Ocean Meets Sky conference of the University of Cape Town's Oceanography Department, and the National Oceans and Coastal Information Management System (OCIMS) amongst many others. Expanding and enhancing our stakeholder network helped to raise the profile of the Unit and the related developments of the organisation amongst the domestic and international marine community. Two newly appointed interns focused on sea-ice research, and ocean observations.

1.3 Sector-specific solution service delivery/ dissemination - Provide targeted sector specific segments with products and services to minimize weather risks on a day-to-day basis

1.3.1 Community WeatherSMART needs analysis for targeted communities

As the mandated authority on weather and climate forecasting, the South African Weather Service (SAWS) has an obligation to reach all 57 million South Africans with weather information on a daily basis. Through various dissemination channels and strategic partnerships, the organisation strived to increase its reach to different sections of the South African population, thereby providing critical information with the aim of saving property and lives. By using multiple dissemination channels, and through a number of strategic partnerships, SAWS is able to ensure that the information can be accessed by all South Africans, including people living with disabilities as well as disadvantaged and rural communities.

Some of the dissemination channels that are currently utilised include commercial and community TV stations, community and commercial radio stations, mobile applications, social media, web portals, Application Programming Interfaces (APIs) and multiple strategic partnerships. Of all the channels, the widest reach is achieved through radio and television. The SAWS currently disseminates information through SABC TV and Radio, E-TV, ENCA and multiple community and commercial TV and radio stations.

As at end of 2019/20, SAWS was able to reach more than 4 million listeners, through the 140 community radio stations that receive daily weather and climate information. In addition, SAWS is able to reach more than 7 million viewers, who watch news daily on SABC, E-TV and ENCA. The SAWS also uses more than 20 SABC radio stations for disseminating weather and climate information. This gives SAWS the potential to reach the more than 30 million listeners who tune in to SABC radio daily.

In order to keep up with newer and disruptive technologies, SAWS has significantly increased the dissemination of information via multiple online platforms such as social media, APIs and web portals. The downloads of the WeatherSMART mobile app increased by more than 10 000 during 2019/20. This brings the total number of downloads of the WeatherSMART APP to 25121.

Programme 2: Research and Innovation

Purpose:
Develop new and improve existing Meteorological Solutions to inform wise socio-economic choices

2.1 Research - Generate new scientific insights in atmospheric and related sciences in collaboration with relevant stakeholders. Expand the existing knowledge base and intelligence related to climate change.

2.1.1 Research outputs (publications, articles, conference papers etc.)

Central to our work at SAWS, as a recognised scientific institution of Government, the 2019/20 financial year saw us publishing 58 scientific articles, which were authored or co-authored by SAWS scientists. Our scientists use three types of publications which are eligible for monitoring, ensuring that high-quality scientific research outputs are carried out to expand the existing knowledge base and intelligence related to weather and climate change within the country. These types of publications include peer-reviewed articles in scientific journals, where SAWS scientists are either the leading or a co-author, conference papers that are peer-reviewed and traceable in the conference proceedings and MSc and PhD theses (dissertations which were reviewed by study leaders and scientists). As per the SAWS mandate, scientific publications are aimed at creating public records of original contributions to knowledge areas, providing intellectual capacity and strengthening both the public and private sectors in terms of decision-making through evidence-based scientific research.

These scientific publications are outputs from key SAWS projects emanating from the memoranda of agreements with strategic partners, while other publications are emanating from initiatives and collaborations where SAWS scientists are involved in covering a wide range of research themes in the climate and atmospheric research within the weather prediction research, climate and environment prediction research and monitoring. Publications relating to weather prediction research included nowcasting and very-short range, short-range and medium-range forecasting, while the climate and environment prediction research and monitoring publications covered research on long-range forecasting, climate change and variability, air quality, applications research, aviation research, marine research, and Global Atmosphere Watch research. The table below reflects a summary of the total number of research outputs based on the three types of publications.

Types of Publications	Number of Publications
Peer-review articles in scientific journals	35
Conference Papers	16
Thesis	1

The publication list is as follows:

Journal Articles 2019/20

2019

ABIODUN, G.J., MAKINDE, O.S., **ADEOLA, A.M.**, NJABO, K.Y., WITBOOI, P.J., DJIDJOU-DEMASSE, R. AND **BOTAI, J.O.** 2019. A Dynamical and Zero-Inflated Negative Binomial Regression Modelling of Malaria Incidence in Limpopo Province, South Africa. *International Journal of Environmental Research and Public Health*, **16**(11), 2000, 19 pp. https://dx.doi.org/10.3390/ijerph16112000

ADEOLA, A.M., **BOTAI, J.O.**, OLWOCH, J.M., **RAUTENBACH, H. C.J. deW.**, ADISA, O.M., DE JAGER, C., **BOTAI, C.M.** AND AARON, M. 2019. Predicting Malaria Cases Using Remotely Sensed Environmental Variables in Nkomazi. *South Africa. Geospatial Health*, **14**(1), pp. 81-91. http://dx.doi.org/10.4081/gh.2019.676

ADEOLA, A., **NCONGWANE, K.**, ABIODUN, G., **MAKGOALE, T.**, RAUTENBACH, H., **BOTAI, J.**, **ADISA, O.** AND **BOTAI, C.** 2019. Rainfall Trends and Malaria Occurrences in Limpopo Province, South Africa. *International Journal of Environmental Research and Public Health*, **16**(24), 5156, 15 pp. https://dx.doi.org/10.3390/ijerph16245156

ADISA, O.M., **BOTAI, J.O**., **ADEOLA, A.M**., **BOTAI, C.M**., HASSEN, A., DARKEY, D., TESFAMARIAM, E., ADISA, A.T., AND ADISA, A.F. 2019. Analysis of Drought Conditions over Major Maize Producing Provinces of South Africa. *Journal of Agricultural Meteorology*, **75**(4), pp. 173-182. https://doi.org/10.2480/agrmet.D-18-00049 ; supplemental information https://www.jstage.jst.go.jp/article/agrmet/advpub/0/advpub_D-18-00049/_supplement/_download/advpub_D-18-00049_1.pdf

BOPAPE, M-J.M., SITHOLE, H.M., MOTSHEGWA, T., RAKATE, E., ENGELBRECHT, F., ARCHER, E., MORGAN, A., NDIMENI, L. AND **BOTAI, J.** 2019. A Regional Project in Support of the SADC Cyber-Infrastructure Framework Implementation: Weather and Climate. *Data Science Journal*, **18**(34), 10 pp. http://dx.doi.org/10.5334/dsj-2019-034

BURLS, N.J., BLAMEY, R.C., CASH. B.A., SWENSON, E.T., AL FAHAD, A., **BOPAPE, M-J.M**., STRAUS, D.M. AND REASON, C.J.C. 2019. The Cape Town "Day Zero" Drought and Hadley Cell Expansion. *npj Climate and Atmospheric Science*, **2**, 27, Aug, 8 pp. https://dx.doi.org/10.1038/s41612-019-0084-6

CADET, J-M., BENCHERIF, H., DU PREEZ, D.J., PORTAFAIX, T., SULTAN-BICHAT, N., BELUS, M., BROGNIEZ, C., AURIOL, F., METZGER, J-M., **NCONGWANE, K**., **COETZEE, G.J.R.** AND WRIGHT, C.Y. 2019. Solar UV Radiation in Saint-Denis, La Réunion and Cape Town, South Africa: 10 years Climatology and Human Exposure Assessment at Altitude. *Atmosphere*, **10**(10), 589, 14 pp. https://doi.org/10.3390/atmos10100589

CHAN, E.K.F., TIMMERMAN, A., BALDI, B.F., MOORE, A.E., LYONS, R.J., LEE, S-S., KALSBEEK, A.M.F., PETERSEN, D.C., **RAUTENBACH, H.,** FÖRTSCH, H.E.A., BORNMAN, M.S.R. AND HAYES, V.M. 2019. Human Origins in a Southern African Palaeo-Wetland and First Migrations. *Nature* **575**(7781), 7 Nov, pp. 185–189. https://doi.org/10/10.1038/s41586-019-1714-1

D'HOTMAN, J.S., MALAN, N., COLLINS, C., **DE VOS, M**., LUMPKIN, R., **MORRIS, T**. AND HERMES, J. 2019. The Use of a Jet Reference Frame to Analyze Drifter Trajectories in the Agulhas Current. *Journal of Geophysical Research*: *Oceans*, **24**(6), Jun, pp. 4238-4247. https://dx.doi.org/10.1029/2018JC014850

DALTON, A., BEKKER, B. AND **KRUGER, A.C.** 2019. Wind Power Variability during the Passage of Cold Fronts across South Africa. *Journal of Energy in Southern Africa*, **30**(3), Aug, pp. 52-67. https://doi.org/10.17159/2413-3051/2019/v30i3a6356

DE VOS, M. AND **RAUTENBACH, C.** 2019. Investigating the Connection Between Metocean Conditions and Coastal User Safety: an Analysis of Search and Rescue Data. *Safety Science*, **117**, Aug, pp. 217-228. https://dx.doi.org/10.1016/j.ssci.2019.03.029

DU, H., ALEXANDER, L.V., DONAT, M.G., LIPPMAN, T., SRIVASTAVA, A., SALINGER, J., **KRUGER, A.**, CHOI, G., HE, H.S., FUJIBE, F., RUSTICUCCI, M., NANDINTSETSEG, B., MANZANAS, R., REHMAN, S., ABBAS, F., ZHAI, P., YABI, I., STAMBAUGH, M.C., WANG, S., BATBOLD, A., DE OLIVEIRA, P.T., ADREES, M., HOU, W., ZONG, S., e SILVA, C.M.S., LUCIO, P.S. AND WU, Z. 2019. Precipitation from Persistent Extremes is Increasing in Most Regions and Globally. *Geophysical Research Letters*, **46**(11), 16 Jun, pp. 6041-6049. https://doi.org/10.1029/2019GL081898

KEAT, W.J., STEIN, T.H.M., **PHADULI, E**., **LANDMAN, S., BECKER, E.**, **BOPAPE, M.M**., HANLEY, K.E., LEAN, H.W. AND WEBSTER, S. 2019. Convective Initiation and Storm Life-Cycles in Convection-Permitting Simulations of the Met Office Unified Model over South Africa. *Quarterly Journal of the Royal Meteorological Society*, 145(721), Apr Pt B , pp. 1323-1336. https://dx.doi.org/10.1002/qj.3487

JACOBS, Q. AND LANDMAN, W.A. 2019. Adding Value to Numerical Weather Predictions for the Aviation Industry in South Africa. *International Journal of Aviation, Aeronautics, and Aerospace*, **6**(5), 11, 22 pp. https://dx.doi.org/10.15394/ijaaa.2019.1428

KRUGER, A.C., RAUTENBACH, H., **MBATHA, S., NGWENYA, S.,** MAKGOALE, T.E. 2019. Historical and Projected Trends in Near-Surface Temperature Indices for 22 Locations in South Africa. *South African Journal of Science*, **115**(5/6), May/Jun, 4846, 9 pp. https://doi.org/10.17159/sajs.2019/4846

KUYPER, B., LESCH, T., **LABUSCHAGNE, C.**, MARTIN, D., YOUNG, D., ANWAR, M., KHAN, M.A.H., WILLIAMS, A.G., O'DOHERTY, S., DAVIES-COLEMAN, M.T., SHALLCROSS, D.E., 2019. Volatile Halocarbon Measurements in the Marine Boundary Layer at Cape Point, South Africa. *Atmospheric Environment*, **214**, Oct, 116833, 10 pp. https://dx.doi.org/10.1016/j.atmosenv.2019.116833

MORRIS, T., **RAUTENBACH, C.** AND **STANDER, J.** 2019. A New Era for Marine Forecasting in South Africa. *South African Journal of Science*, **115** (5/6), 6170, May/Jun, 2 pp. https://dx.doi.org/10.17159/sajs.2019/6170

NTSANGWANE, L., **MABASA, B.**, SIVAKUMAR, V., ZWANE, N., **NCONGWANE, K. AND BOTAI, J.** 2019. Quality Control of Solar Radiation Data within the South African Weather Service Solar Radiometric Network. *Journal of Energy in Southern Africa*, **30**(4), Nov, pp. 51-62. https://doi.org/10.17159/2413-3051/2019/v30i4a5585

PFAFF, M.C., LOGSTON, R.C., RAEMAEKERS, S.J.P.N., HERMES, J.C., BLAMEY, L.K., CAWTHRA, H.C., COLENBRANDER, D.R., CRAWFORD, R.J.M., DAY, E., DU PLESSIS, N., ELWEN, S.H., FAWCETT, S.E., JURY, M.R., KARENYI, N., KERWATH, S.E., KOCK, A.A., KRUG, M., LAMBERT, S.J., OMARDIEN, A., PITCHER, G.C., **RAUTENBACH, C.**, RONINSON, T.B., ROUAULY, M., RYAN, P.G., SHILLINGTON, F.A., SOWMAN, S., SPARKS, C.C., TURPIE, J.K., VAN NIEKERK, L., WALDRON, H.N., YELD, E.M. AND KIRKMAN, S.P. 2019. A Synthesis of Three Decades of Socio-ecological Change in False Bay, South Africa: Setting the Scene for Multidisciplinary Research and Management. *Elemental: Science of the Anthropocene*, **7**, Art. 32, 49 pp. http://dx.doi.org/10.1525/elementa.367

PINARDI, N., **STANDER, J.**, LEGLER, D., O'BRIEN, K., BOYER, T., CUFF, T., GARCIA, H., FREEMAN, E., SUB. C., GATES, L., GONG, Z., IONA, A., XINYANG, Y., BAHUREL, P., BELBOUCH, M., BELOV, S., BRUNNER, S.L., BURGER, E.F., CARCAL, T., CHANG-SENG, D., CHARPENTIER, E., COPPINI, G., FISCHER, A.S., GALLAGE, C., HERMES, J., HESLOP, E., GRIMES, S., HILL, K.L., HORSBURGH, K.J., MANCINI, S., MOODIE, N., OUELLET, M., POLI, P., PISSIERSSENS, P., PROCTOR, R., SMITH, N., SWAIL, V. AND TURTON, J.D. 2019. The Joint IOC (of UNESCO) and WMO collaborative effort for met-ocean services. *Frontiers in Marine Science*, **6**, 410, Aug, 23 pp. https://dx.doi.org/10.3389/fmars.2019.00410

RAUTENBACH, C., **BARNES, M.A.** AND **DE VOS, M.** 2019. Tidal Characteristics of South Africa. *Journal of Deep Sea Research I*, **150**, 103079, 20 pp. https://doi.org/10.1016/S0967-0637(19)30237-7

ROEMMICH, D., ALFORD, M.H., CLAUSTRE, H., JOHNSON, K.S., KING, B., MOUM, J., OKE, P.R., OWENS, W.B., POULIQUEN, S., PURKEY, S., SCANDERBEG, M., SUGA, T., WIJFFELS, S.E., ZILBERMAN, N., BAKKER, D., BARINGER, M.O., BELBEOCH, M., BITTIG, H.C., BOSS, E., CALIL, P., CARSE, F., CARVAL, T., CHAI, F., CONCHUBHAIR, D.O., D'ORTENZIO, F., DALL'OLMO, G., DESBRUYÈRES, D., FENNEL, K., FER, I., FERRARI, R., FORGET, G., FREELAND, H., FUJIKI, T., GEHLEN, M., GREENAN, B., HALLBERG, R., HIBIYA, T., HOSODA, S., JAYNE, S., JOCHUM, M., JOHNSON, G.C., KANG, K-R., KOLODZIEJCZYK, N., KOERTZINGER, A., LE TRAEON, P.Y., LENN, Y-D., MAZE, G., MORK, K.A., **MORRIS, T.**, NAGAI, T., NASH, J., GARABATO, A.N., OLSEN, A., PATTABHI, R.R., PRAKASH, S., RISER, S., SCHMECHTIG, C., SHROYER, E., STERL, A., SUTTON, P., TALLEY, L., TANHUA, T., THIERRY, V., THOMALLA, S., TOOLE, J., TROISI, A., TRULL, T., TURTON, J.D., VELEZ-BELCHI, P.J., WALCZOWSKI, W., WANG, H., WANNINKHOF, R., WATERHOUSE, A., WATSON, A., WILSON, C., WONG, A.P., XU, J. AND YASUDA, I. 2019. On the Future of Argo: a Global, Full-Depth, Multi-Disciplinary Array. *Frontiers in Marine Science*, **6**, 439, Aug, 28 pp. https://dx.doi.org/10.3389/fmars.2019.00439

TSHEHLA, C. AND WRIGHT, C.Y. 2019. 15 Years after the National Environmental Management Air Quality Act: is Legislation Failing to Reduce Air Pollution in South Africa? *South African Journal of Science*, **115**(9/10), Sep/Oct, 6100, pp. 27-30. https://dx.doi.org/10.17159/sajs.2019/6100

TSHEHLA, C. AND WRIGHT, C.Y. 2019. Spatial Variability of PM10, PM2.5 and PM Chemical Components in an Industrialised Rural Area within a Mountainous Terrain. *South African Journal of Science*, **115**(9/10), Sep/Oct, 6174, pp. 31-40. https://dx.doi.org/10.17159/sajs.2019/6174

VEITCHA, J., **RAUTENBACH, C.**, HERMES, J. AND REASON, C. 2019. The Cape Point Wave Record, Extreme Events and the Role of Large-Scale Modes of Climate Variability. *Journal of Marine Systems*, **198**, 103185, 14 pp. https://dx.doi.org/10.1016/j.jmarsys.2019.103185

VICHI, M., EAYRS, C., ALBERELLO, A., BEKKER, A., BENNETTS, L., HOLLAND, D., DE JONG, E., **JOUBERT, W.**, MACHUTCHON, K., MESSORI, G., MOJICA, J., ONORATO, M., SAUNDERS, C., SKATULLA, S. AND TOFFOLI, A. 2019. Effects of an Explosive Polar Cyclone Crossing the Antarctic Marginal Ice Zone. *Geophysical Research Letters*, **46**(11), Jun, pp. 5948-5958. https://dx.doi.org/10.1029/2019GL082457

2020

BLESIĆ, S.M., **DU PREEZ, D.J.**, STRATIMIROVIĆ, D.I., AJTIĆ, J.V., AND WRIGHT, C.Y. 2020. Characterization of Personal Solar Ultraviolet Radiation Exposure Using Detrended Fluctuation Analysis. *Environmental Research*, **182**, Mar, 108976. https://doi.org/10.1016/j.envres.2019.108976

GELDENHUYS, M., DYSON, L.L. AND **VAN DER MESCHT, D.** 2020. Blocking, Gap Flow and Mountain Wave Interaction Along the Coastal Escarpment of South Africa. *Theoretical and Applied Climatology*, **139**, pp. 1291-1303. https://dx.doi.org/10.1007/s00704-019-03030-4

KUYPER, B., WINGROVE, H., LESCH, T., **LABUSCHAGNE, C.,** SAY, D., MARTIN, D., YOUNG, D., KHAN, M.A.H., O'DOHERTY, S., DAVIES-COLEMAN, M.T. AND SHALLCROSS, D.E. 2020. Atmospheric Toluene and Benzene Mole Fractions at Cape Town and Cape Point and an Estimation of the Hydroxyl Radical Concentrations in the Air above the Cape Peninsula, South Africa. *ACS Earth and Space Chemistry*, **4**(1), pp. 24-34. https://doi.org/10.1021/acsearthspacechem.9b00207

MUNTHALI, M.G., MUSTAK, S., **ADEOLA, A., BOTAI, J.**, SINGH. S.K. AND DAVIS, N. 2020. Modelling Land Use and Land Cover Dynamics of Dedza District of Malawi Using Hybrid Cellular Automata and Markov Model. *Remote Sensing Applications: Society and Environment*, **17**, Jan, 100276. https://dx.doi.org/10.1016/j.rsase.2019.100276

NCIPHA, X.G. AND SIVAKUMAR, V. 2020. Natural Carbon Sequestration by Forestry, in Inamuddin, Asiri A., Lichtfouse E. (eds), *Sustainable Agriculture Reviews*, **37**, pp. 73-92. https://doi.org/10.1007/978-3-030-29298-0_4

NCIPHA, X.G., SIVAKUMAR, V. AND MALAHLELA, O. 2020. The Influence of Meteorology and Air Transport on CO2 Atmospheric Distribution over South Africa. *Atmosphere*, **11**(3), Mar, 287, 25 pp. **https://doi.org/10.3390/atmos11030287**

PHAKULA, S., LANDMAN, W.A., **ENGELBRECHT, C.J**. AND **MAKGOALE, T**. 2020. Forecast Skill of Minimum and Maximum Temperatures on Subseasonal-to-Seasonal Timescales over South Africa. *Earth and Space Science*, **7**(2), Feb, 11 pp. https://dx.doi.org/10.1029/2019EA000697

SWARTZ, J.-S., VAN ZYL, P.G., BEUKES, J.P., **LABUSCHAGNE, C.**, BRUNKE, E.-G., PORTAFAIX, T., GALY-LACAUX, C. AND PIENAAR, J.J. 2020. Twenty-one Years of Passive Sampling Monitoring of SO2, NO2 and O3 at the Cape Point GAW Station, South Africa. *Atmospheric Environment*, **222**, 1 Feb, 117128. https://dx.doi.org/10.1016/j.atmosenv.2019.117128

VIRAPONGSE, A., PEARLMAN, F., PEARLMAN, J., **MURAMBADORO, M.D**., KUWAYAMA, Y. AND GLASSCOE, M.T. 2020. Ten Rules to Increase the Societal Value of Earth Observations. *Earth Science Informatics*, **13**(1), Mar, 15 pp. https://dx.doi.org/10.1007/s12145-020-00453-w

Conference Abstracts/Papers/Newsletter Articles 2019/20

2019

DE WIT, J., **BOTAI, C.M.**, **BOTAI, J.** AND **LETSHWITI, K.** 2019. Towards Implementing a Mesoscale Hydrological Model at SAWS: Initial Results, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 114-117. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

ENGELBRECHT, C.J. 2019. Seasonal Cycle Attributes of S2S Predictive Skill Over the Westerly and Easterly Weather Regime Regions of Southern Africa, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 118-119. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

HELZEL, T., HOLTON, L., PETERSEN, L. AND **RAUTENBACH, C.** 2019. Monitoring of the Coastal Zones and the EEZ by Ocean Radar: a Review of the Potential of this Technology, *in ICOE2019, 5th International Conference in Ocean Engineering*, 28 July-1 August, at Le Meridien Village Hall Lane, Pointe aux Piments, Mauritius, 9 pp.

LANDMAN, S. AND **MARX, E.** 2019. Improvements in Predicting the Likelihood of Severe Events, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 44-46. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

LEKOLOANE, L.E., **BOPAPE, M-J. M.** AND **RAMBUWANI, T.G.** 2019. Investigating the Role of Near-Surface Atmospheric Boundary Layer Moisture Flux in Supercellular Tornadogenesis over Gauteng during December 2017, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 27-30. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

LETSHWITI, K., **BOTAI, C.**, **BOTAI, J.** AND **DE WIT, J.** 2019. Investigation of Spatio-Temporal Changes of Drought in the Eastern Cape Province, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 47-51. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

MAKONDO, A.L. AND **ADEOLA, A.** 2019. Influence of Climate on the Spatiotemporal Distribution of Malaria at Thulamela Municipality, Limpopo, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 68-72. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

MASANGO, N.M., BOTAI, C. AND **MUNGHEMEZULU, C**. 2019. Sensitivity Analysis of the SPI to Statistical Distribution Functions: A case study of the Western Cape Province, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 52-55. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

MBATHA, N., BENCHERIF, H., SIVAKUMAR, V. AND **MKOLOLO, T.** 2019. Stratospheric Ozone Time Series Prediction and Forecasting Using LSTM and Hybrid ARIMA-ANN approach, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 120-124. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

MENDES, J., **BOTAI, J., ZWANE, N. AND MABASA, B.** 2019. An assessment of surface shortwave radiation in South Africa, in *6th International Conference Energy & Meteorology: Abstract Submission,* 24-27 June 2019, Copenhagen, Denmark. http://icem2019-abstract-submission.p.wemc.currinda.com/days/2019-06-26/abstract/677

MKOLOLO, T., MBATHA, N., SIVAKIMAR, V., **LABUSCHAGNE, C.**, **JOUBERT, W.**, **MBAMBALALA, E.T.** AND **MARTIN, L.** 2019. Day-time and Night-time Ozone Increase at Cape Point GAW Station as Observed by Ground Based Instruments, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 84-87. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

SHIVAMBU, K.L., **BOTAI, C.M.** AND MUNGHEMEZULU. 2019. Influence of the Variability of Hydro-Meteorological Parameters on Dam Levels in the Western Cape Province, in *the 35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 75-78**.** ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

SITHOLE, S., **NCONGWANE, K.** AND **BOTAI, J.** 2019. Evaluating the Wet Bulb Globe Temperature Index at Irene Weather Office (p. 92-94), in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 92-94. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

WEBSTER, E.M. AND DYSON, L.L 2019. Africanes, often unidentified but never to be underestimated, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 130-134. ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

WEBSTER, E.M. AND TURNER, K. 2019. A New User-Orientated Severe Weather Warning System for South Africa, in the *35th Annual Conference of the South African Society for Atmospheric Science*, 8-9 October 2019, Riverside Sun, Vanderbijlpark [Gauteng], pp. 135-138 ISBN 9780639844206. http://www.arc.agric.za/arc-iscw/SASASconference/Documents/SASAS%20-%20Abstract%20book.pdf

2020

MAISHA, R., **LANDMAN, S.**, **BOPAPE, M.-J.** AND BOYD, D. 2020. Ensemble Forecasting and Data Assimilation at SAWS, in *Proceedings of the EMMDA International Conference (EMMDA–2020)*, NCMRWF (MoES), Noida, 24-26 February 2020, 2 pp. https://www.ncmrwf.gov.in/event/emmda/Abstracts/Abstract-RMaisha_EMMDA_TS02_Day02.pdf

Thesis

ZWANE, N.N. 2019. Investigating the Influence of Present and Projected Climate on the Livelihood of Small-Scale Farmers in the uThungu District Municipality, KwaZulu-Natal, South Africa. Dissertation (M.Sc) -- University of Pretoria. http://hdl.handle.net/2263/70346

2.1.2 Earth System science

The nature and intent of Research and Innovation's contribution to the broader mandate of the organisation manifest in knowledge generation through fundamental, applied and social sciences research. This is underpinned by a multi-disciplinary research approach which is supported by the earth system modelling framework. Highlights for the period under review were:

Numerical weather and climate modelling

In order to provide weather forecasts and climate predictions beyond the nowcasting timescale, SAWS relies on the use of numerical weather and climate models. The main operational Numerical Weather Prediction (NWP) model that SAWS is using is the UK Met Office (UKMO) Unified Model (UM). The UM is running with a grid spacing of 4.4 km over Southern Africa and 1.5 km over South Africa and these simulations are updated four times daily. During 2019, SAWS operationalised a multi-model ensemble system using the UM simulations produced at SAWS and input from global models run by international meteorological organisations. Information from this ensemble system was made available to the forecasters on a daily basis. SAWS also installed the Wave Watch III model on the CRAY system and operationalised it at a resolution of 13 km. The high-resolution wave and storm surge (SWaSS) and tide (SAWS-TM) forecasting systems were operationalised on the SAWS Marine Portal at 2 km, with the regional models at 6 km. SAWS also continued to run a coupled ocean-atmosphere model to produce seasonal forecasts on a monthly basis to maintain its WMO Global Producing Centre (GPC) of Long-range forecasts status.

Atmospheric composition modelling

Over the past year, the SAWS atmospheric composition modelling conducted coupled climate-chemistry modelling system sensitivity analyses via modifying the coupled model system physics schemes and regional parameterisations. To increase the model accuracy, coupled model system alterations were conducted utilising atmospheric composition properties determined from atmospheric chamber analysis and field observations. This is crucial in reducing the uncertainties associated with modelling atmospheric composition and properties. This system was deployed to conduct a higher resolution national scale simulation of air pollutant exposure with a higher accuracy. As reported in the section on products developed, this is important to determine ambient air pollutant exposure contributions to the national burden of disease. Furthermore, this optimized coupled system was deployed to provide a service in the quality management and planning programme of the Mpumalanga province. This included the provision of: (1) Quantile regression based on downscaled high resolution spatio-temporal profiles of natural and anthropogenic emissions; (2) a threshold of criteria and photochemical pollutants spatio-temporal distributions and deposition rates; (3) Climatological information that governs the emission, transportation, chemistry and deposition of air pollutants; and (4) an air quality scenario tool. This information is very important for the development of an effective and equitable air quality management programme and its implementation.

Agro-hydro-meteorological modelling

The Mesoscale Hydrological Model (MHM) was successfully installed and is currently undergoing verification at SAWS. It will be used for a variety of hydro-meteorological applications research. The model verification was tested using datasets prepared in-house. Once fully operational, the MHM will be utilised for hydrological forecasting, including streamflow and runoff; drought monitoring and forecasting; and catchment studies to understand the impacts of hydrological processes within each phase of hydrological cycle to the environment. Furthermore, the agrometeorological models are important tools used for, amongst others, crop yield simulation studies.

Numerical Models Development

Numerical weather and climate models currently in use in South Africa for operational purposes and responding to the country's policy needs, were developed outside of the African continent. SAWS engaged with some research institutions and universities in South Africa to develop a model development framework. A summary of this framework was published in the South African Journal of Science as a scientific correspondence and also received media coverage through Groundup, News24 and others. As part of the Climate Research for Development (CR4D) discussed below, SAWS brought two model developers from NASA and the University of Reading to attend workshops in South Africa in August and December, respectively, to initiate meaningful model development collaboration with these institutions. There are a number of Masters and PhD students registered at the Universities of Witwatersrand, North West and Pretoria, co-supervised by SAWS employees, who are addressing topics that will help the country advance its model development capacity.

2.1.3 Key projects

Aviation Research and Demonstration Project (AvRDP)

The Aviation Research and Demonstration Project (AvRDP) was an initiative between the Commission for Atmospheric Sciences and World Weather Research Programme from WMO as well as the Commission for Aeronautical Meteorology, with the aim of demonstrating the capability of nowcasting and mesoscale modelling techniques in support of the Aviation System Block upgrades under the new Global Aviation Navigation Plan endorsed by the International Civil Aviation Organization. Eleven international airports participated in the AvRDP and SAWS represented OR Tambo International Airport (ORTIA). The project consisted of two phases, and phase 2 of the project, which involved the translation of meteorological information into Air Traffic Management impact, was completed. SAWS developed a new impact-based nowcasting tool for ORTIA and hosted the concluding AvRDP seminar as well as science steering committee meeting during the 2019/20 financial year. The project officially came to an end on 31 October 2019.

Weather and Climate Science for Service Partnership South Africa (WCSSP-SA) Project

The WCSSP project in South Africa is a collaborative initiative between the UK Met Office and the South African Weather Service. This partnership is funded by the UK government's Newton Fund. The project aims to promote economic development and social welfare in South Africa, through science development and innovation that improves weather and climate services. Within the project there are a number of work packages addressing specific objectives such as 1) Developing and evaluating high resolution models to improve prediction of high-impact weather, 2) Strengthen institutional capability by developing data services and analytical skills to effectively use the model output, and 3) Develop capacity to support the development of user-led weather services. The energy applications group falls under work package 2: Focusing on ancillary services for the Energy Industry, underpinned by the Unified Model for weather forecasting. Major milestones included successful validation and verification between SAWS solar radiometric stations and the Unified model using Site Specific Processes System (SSPS), identification of sources of errors (cloud, dust or aerosols) and correction of biases between model and observation through the application of the Kalman Filter correction factor.

Transforming Weather, Water Data into value-added Information Services for Sustainable Growth in Africa (TWIGA) Project

The TWIGA project is a strategic partnership between sub-Saharan African countries. The overarching aim of the project is to transform weather water data into value-added information services for sustainable growth in Africa. The main role of the energy group at SAWS is to develop a short-term prediction for the amount of solar radiation reaching the surface, by extrapolating cloud movements and daily cloud formation patterns. This will be achieved through integrating the TAHMO observation stations across Africa and running the high-resolution UM for south and southern Africa. The project enables SAWS to access TAHMO stations, and downloading of meteorological parameters such as temperature, rainfall, wind speed and direction and solar radiation. Products developed will be made available on the HydroNet Platform and to potential users including solar plant operators, municipalities and utilities. Test verification cases are to be done using SSPS to observe any uncertainties.

University of Pretoria (UP) and South African Weather Service Biomet Project

The University of Pretoria and South African Weather Service Biomet Project is a collaborative initiative that aims to install a biometeorological weather station at the UP Mamelodi Campus. The station will measure health-related parameters including ultraviolet radiation (UVB), as well as a black globe sensor that measures the globe temperature used in the assessment of heat stress, air quality pollutants, including Nitrogen dioxide (NO_2), Sulphur dioxide (SO_2), Carbon monoxide (CO) and Ozone (O_3), and Particulate Matter ($PM_{2.5}$ and PM_{10}) and standard weather parameters including air temperature (°C), relative humidity (%), wind speed (ms^{-1}) and direction at 2 m above ground, rain (mm), solar radiation (Wm^{-2}). The data measured at the station forms an integral part of public health intervention to mitigate climate change health-related morbidity and mortality outcomes through the development of early warning systems and other application tools that will provide timely warning to people of the expected extreme weather events. The project promotes capacity building of university students and students from the surrounding schools.

Climate Research for Development (CR4D) Fellowship Project

SAWS is working on a project to improve weather and climate early warnings in southern Africa with a focus on numerical weather prediction. The project is funded through the Climate Research for Development (CR4D) fellowship which is funded through DFID and implemented by the African Academy for Sciences (AAS). The project team includes hosts of High Performance Computing (HPC) systems and Meteorological Services in Botswana, Namibia, South Africa, Mozambique, Zambia and Tanzania. Through the project, the Weather Research and Forecasting (WRF) was implemented in all six countries on the HPC systems and used to simulate heavy rainfall events. The research questions being addressed include testing of sensitivity to microphysics schemes, turbulence, resolution and convection schemes. The project will help train the participating countries in implementing and running NWP models, analyses of model simulations and observations, and writing of papers to improve research output coming out of Africa. In other countries, the implemented model will be used for operational forecasting going forward.

Umngeni Resilience Project (URP)

The Umngeni Resilience Project (URP) is a cooperation between Umngeni water, the University of KwaZulu-Natal's School of Agriculture, Earth and Environmental Sciences (UKZN–SAEES) and the South African Weather Service. The joint research project is geared toward the development and up-scaling of a ward-based multi-hazard early warning system (EWS) linked to (i) floods, (ii) fire, (iii) lightning, (iv) agrometeorology, (v) air quality, and (vi) drought in support of national programmes such as the National Framework for Climate Services (NFCS) which seeks to ensure early warning and response systems are developed in order to improve preparedness and adaptive capacity of local communities and small-scale farmers, drawing on and integrating scientific and local indigenous knowledge.

South32 Project

The assets of South32, a mining and metals company, are influenced by climatic variables like rainfall and temperature, and in particular by extremes in these variables. The company operates in both the eastern parts of South Africa. The aim of the project is to have a better understanding of the risks related to the climate in which the company operates, both in terms of the current climate with frequencies of extremes and anticipated future changes in climate as a result of global warming. This will allow for South32 to structure its assets according to the prevailing and projected climate variability boundaries in order to ensure that the company becomes socially conscious of its role and impact within the local environment by redesigning its assets and operations. The project was approved for a sum of R501,504.00. It was a joint project between the Research department and the Climate Service department. The project was completed and delivered during May 2019.

Water Research Commission Projects

The SAWS, in partnership with the Water Research Commission (WRC), has implemented the following projects during the period under review:

a. *Sustainable water-based agricultural activities in rural communities - From theory to practice: Developing a case study and guidelines for Water-Energy-Food (WEF) nexus implementation in Africa - C2019/2020-00020*
   This project focuses on the WEF nexus assessment for southern and eastern Africa. The aim of the project is to conduct a state-of-the-art WEF nexus assessment for any region in the African continent by identifying status, opportunities and possible regional case studies and to develop the WEF nexus guidelines. To achieve this, an area in the Limpopo Valley in South Africa, and another in the Mara catchment in Kenya were identified as case studies and to form the basis for the development of guidelines for WEF nexus implementation in Africa. The project was jointly contracted to the South African Weather Service and the Kenya Water Institute, in collaboration with other South African institutions such as the Central University of Technology and KwaZulu-Natal University, and Kenyan institutions such as Maasai Mara University and Kenya Meteorological Department by the South African Water Research Commission. The project commenced on 15 February 2020 and will end on 31 March 2023.

b. *An investigation of the historical and projected occurrence of the South African mid-summer drought and its implications for the agro-water budget*
   The project focuses on mid-summer drought analysis and investigates the frequency, intensity and duration of mid-summer dry spells in South Africa. The project also investigates the ability of climate models to capture the mid-summer dry spells under conditions of global warming. Crop growth models will be used to simulate the impact of the mid-summer dry spells on maize yields in South Africa. The aims and deliverables of the

project are: To perform a detailed temporal and spatial analysis of the mid-summer rainfall in South Africa; To perform synoptic diagnoses in order to identify the synoptic weather system and sea surface temperature drivers of the mid-summer dry spells; To determine whether mid-summer dry spell anomalies are captured in historical climate model simulations; To generate climate change projections of possible future changes in the time of occurrence, frequency and intensity of the South African mid-summer drought; To use a crop model to estimate the impact of the South African mid-summer drought on the agro-water budget and maize yields; To produce and implement a recommended planting date early warning system for application in the agricultural sector. The project originally started on 1 April 2018 and will end on 31 March 2021.

c. *Climate Change and Water Security: Developmental Perspectives for Water-Linked Sectors in a Future Climate for Africa - C2029/2020-00017*
The aim of this research is to conduct a comparative analysis of climate change impacts on future development and economic growth for priority water-linked sectors in the Limpopo River Basin (LRB), South Africa and the Mara River Basin (MRB), Kenya. Objectives of the project are: Evaluation of expected changes in extreme climate and weather events; Comparative analysis to characterise and assess the risks and impacts of the projected future climate on water security and other linked sectors across the two regions; Recommendation of short, medium- and long-term adaptation strategies including opportunities for developmental response; Recommendation of policy actions including communal land management policies that can reduce the impacts of climate change and variability. The project was jointly contracted to the South African Weather Service and the Kenya Water Institute, in collaboration with other South African institutions such as the Central University of Technology and KwaZulu-Natal University, and Kenyan institutions such as Maasai Mara University and Kenya Meteorological Department by the South African Water Research Commission. The project is awarded for a total sum of R 2,000,000. The project commenced on 01/10/2019 and will end on 03/10/2022.

2.2 Solution development/maintenance - Provision of innovative meteorological and related products and services through the development and implementation of a community weather-smart products and service plan

2.2.1 Solutions developed

The SAWS provides products and services that assist decision makers in weather sensitive sectors. During the reporting period, five new solutions were developed, aimed at protecting and minimising weather risks to vulnerable communities as well as the provision of sector specific decision-making products on weather and climate. The priority economic sectors targeted were the agriculture, water, energy, health, aviation, marine and Disaster Risk Reduction (DRR) sectors. These sectors and products were determined following market requirements gathered during sessions related to the SAWS Integrated Service Strategy (ISS) and are as follows:

a. *Community and Disaster Risk Reduction (DRR) sector: Lightning Nowcasting Product*
Radars are essential tools to track thunderstorms to forecast the movement of storms for the next 30 to 60 minutes. Unfortunately there are large areas of South Africa not covered by radar, while in some areas temporary outages in a radar due to technical faults can leave those areas without nowcasts during thunderstorms. SAWS operates a lightning detection network which covers the entire country and with high availability levels. Lightning data can thus be utilised to provide services where radar goes off-line, providing a pseudo-radar service. A product was developed whereby tracking algorithms applied to lightning data can track and nowcast thunderstorms every six minutes in a way similar to the traditional radar tracking algorithms. Thirty-minute, and sixty-minute forecast tracks are created, and the product is available on the nowcasting webpage. The Lightning Detection Network is used as a proxy for radar services in cases where the latter becomes unavailable.

b. *Aviation sector: Impact-based AvRDP Product to all Major Airports*

Thunderstorms can have major impacts on operations at airports whereby flights are delayed, arrival/departure rates are reduced, and stoppages occur when ground crews need to be moved to safety. Providing accurate weather information prior to and during thunderstorms is crucial for airport managers to ensure minimal disruptions while maintaining high levels of safety. Currently radar information is utilised to inform airport managers of what the weather will be in the next hour or two. Collaboration with the aviation sector occurred through the provision of adverse weather event data by the Airport Management Centre at OR Tambo International Airport. In combination with radar data, hourly regression equations were developed to predict the number of flights expected to be delayed, and the probability of rate reductions and stoppages at the airport.

c. *Community and Disaster Risk Reduction (DRR) sector: Multi-Model Ensemble Prediction System*

The Multi-Model Ensemble Prediction System (MM-EPS) product provides objective probability forecasts which serve as a guide to an operational forecaster regarding the relative uncertainty in the prediction of expected weather events. This product covers the SADC domain (similar to the existing UM SA4 domain), produces hourly forecasts with a lead-time of 48-hours and is resampled to a common resolution of 0.054° (~6 km) with similar validity times. The Numerical Weather Prediction models contributing to the MM-EPS product are GFS (NCEP), ICON (DWD), GA (Met Office) and the locally run UM SA4 forecasts. The product updates regularly once a day, producing a 12 ensemble member forecast and is available for viewing and utilization by the forecasters at http://cyclone-web.saws.co.za/mmens_view.html.

During the reporting period, feedback was given from several forecasters indicating and identifying possible errors and sensitivities of the system. The errors were rectified, and the system was also made more resilient to the variability of availability of the individual members. In parallel to these efforts, the multi-model system is also being expanded to include forecast products arriving outside (lag) the time window for incorporation into the multi-model system. The current product is only valid for the 00Z cycle forecasts, but the upgrade under testing considers all the four cycles, 00Z, 06Z, 12Z and 18Z expanding the ensemble members to 39 per forecast.

d. *Health Sector: Malaria Prediction System Product*

The Malaria Prediction System (MPS) product plays a crucial role in risk management for the health care industry. The product incorporates climatic, environmental and socio-economic variables to enhance the implementation of appropriate and effective interventions to reduce the number of expected malaria cases and associated deaths. This product, amongst others, helps to improve the operational decision-making process by health workers and policymakers. The product will also help to produce alerts for authorities on the possible outbreak of malaria. The product has been developed and will be co-integrated and implemented with the Infectious Diseases Early Warning System (iDEWS). The iDEWS Bureau will be co-hosted by SAWS and The National Institute of Communicable Diseases (NICD). The malaria early warning system (MEWS) has been tested in the Limpopo and Mpumalanga Provinces and has yielded good results for effective planning and malaria control.

e. *Health Sector: Air Quality Scenario Tool for Mpumalanga Air Quality Management and Planning*

Based on downscaled high-resolution emissions, different scenario simulations for the air quality management and planning programme of the Mpumalanga province were conducted. This product provides high resolution air quality conditions for different sector-based emission reduction scenarios. The product is important for the provincial authorities in order to determine under which emission reduction strategy the intended air quality standard could be achieved. This is also significant for the authorities, resource managers and policy makers to conduct cost benefit analyses for emission reduction strategies as well as to prepare short and long term plans. The product (scenario simulations and analysis) was completed with user inputs and was delivered to the user group and clients during the period under review.

Programme 3: Infrastructure and Information Systems

Purpose:
Upgrade, Expand and Optimise Infrastructure

3.1 Ensure optimal infrastructure and systems uptime of observations, information dissemination and exchange that enables SAWS to achieve its mandate

3.1.1 Observations Infrastructure Network

The South African Weather Service operates an observational infrastructure consisting of a radar network, a Lightning Detection Network (LDN), an upper-air sounding network and a surface-observation network.

3.1.2 Infrastructure performance

The overall infrastructure performance for 2019/20 is reflected in Table 5.

Table 5: Overall infrastructure performance for 2019/20.

INFRASTRUCTURE	2019/20 AVAILABILITY TARGET	2019/20 PERFORMANCE
Radar (Tier 1)	80%	91.9%
LDN	90%	92.0%
Automatic Weather Station (AWS)	85%	87.7%
Automatic Rainfall Station (ARS)	85%	82.7%

The radar quarterly and annual overall performance is reflected in Table 6.

Table 6: Radar quarterly and annual overall performance.

PERIOD	AVAILABILITY (AVERAGE)	APP TARGET (TARGET)	COMMENTS
Quarter 1	85.27%	80%	Maintenance contract on airconditioners and generators a challenge – peripheral equipment impacts the performance of Radars.
Quarter 2	94.88%	80%	Maintenance contract on airconditioners and generators a challenge – peripheral equipment impacts the performance of Radars.
Quarter 3	97.05%	80%	Power and peripheral equipment failures remained the main challenge.
Quarter 4	90.37%	80%	Port Elizabeth Radar excluded from the combined index.
Annual Average	**91.89**	**80%**	

The LDN quarterly and annual overall performance is reflected in Table 7.

Table 7: LDN quarterly and annual overall performance.

	NAME OF SITE	Q1(%)	Q2(%)	Q3(%)	Q4(%)	AVERAGE %/ YEAR
1	Pretoria/Irene	98,24	93,72	98,75	97,86	97,14
2	Richards Bay	99,47	94,59	95,55	86,89	94,13
3	Vernon Crookes	97,20	94,57	98,21	99,86	97,46
4	Mthatha	82,10	99,26	96,29	96,93	93,65

	NAME OF SITE	Q1(%)	Q2(%)	Q3(%)	Q4(%)	AVERAGE %/ YEAR
5	East London	89,89	99,62	99,54	99,81	97,21
6	Port Elizabeth	99,56	99,63	99,36	100,00	99,64
7	Bethlehem	99,27	93,48	0,00	0,00	48,19
8	Kimberley	91,15	98,44	97,44	98,20	96,31
9	Lephalale/Ellisras	99,46	99,23	99,27	96,11	98,52
10	Sahara	0,00	0,00	91,87	89,52	45,35
11	Aliwal North	98,02	98,91	99,46	97,98	98,59
12	Kathu	99,38	99,62	98,21	96,07	98,32
13	Aberdeen	99,5	99,43	99,90	99,86	99,67
14	Cape Town	99,29	97,44	58,87	77,15	83,19
15	George	86,42	99,71	99,94	99,87	96,49
16	Upington	95,53	98,76	97,86	98,88	97,76
17	Calvinia	98,47	98,40	98,44	96,94	98,06
18	Mafikeng	94,59	94,54	87,03	89,22	91,34
19	Springbok	98,59	98,98	92,91	93,95	96,11
20	Vryheid	97,64	99,60	94,61	98,11	97,49
21	Lebowakgomo	96,87	93,99	81,03	93,56	91,36
22	Musina	98,67	99,01	95,38	92,54	96,40
23	Alkantpan	99,12	98,75	99,90	96,94	98,68
24	Wolwespruit	98,53	99,04	97,70	93,91	97,29
Average – Data Availability		**92,37**	**93,70**	**90,73**	**91,26**	**92,01**
Average – Data Loss		**7,63**	**6,30**	**9,27**	**8,74**	**7,99**

The AWS and ARS monthly performance and annual overall performance are reflected in Table 8.

Table 8: AWS and ARS monthly and annual overall performance.

2019/20		AWS	SENSOR FUNCTIONALITY (%)					ARS
FINANCIAL YEAR	MONTHS	% SYSTEM AVAILABILITY	TEMPERATURE	HUMIDITY	PRESSURE	WIND	RAIN	% SYSTEM AVAILABILITY
	April	83,9	87,7	88,5	89,4	88.0	88,9	78,7
	May	83,9	88,5	89,8	88,9	84,95	91	79,9
	June	84,7	90,2	90,2	88,5	88,6	91	81,8
	July	88,6	93,2	93,2	92,7	91,4	94	84,7
	August	88,1	90,6	90,6	90,3	90,4	91,5	81,9
	September	91,9	94	93,6	94	94,2	95,3	82,6
	October	89,8	92,3	92,3	94	94,1	95,7	87,3
	November	89,8	91,9	91,9	93,2	93,6	94,9	82,1
	December	88,1	90,2	90,2	91,1	90,8	91	83,2
	January	86	87,2	87,2	88,5	87,7	88,5	82,7
	February	87,7	89,4	90,2	89,8	90,3	91	86,9
	March	86,4	90.6	90.2	91.1	91.5	93.2	80,7
Average		**87,4**	**90,5**	**90,7**	**91**	**90,6**	**92,1**	**82,7**

3.1.3 Observation Infrastructure Challenges

The following were identified as challenges that had a negative impact on the performance of the different infrastructure networks:

Table 9: Chalenges that had a negative impact on the performance of the different infrastructure networks.

RADAR SITE	COMMENTS
Bloemfontein	The radar is beginning to suffer from the inadequacies of auxiliary systems and third-party interactions: • The UPS being out of service due to defective battery pack. • Obsolescence in airconditioning units – this resulted in frequent failure of the airconditioners. • Load shedding which resulted in the start and stop of the radar unserviceability of the UPS.
Mthatha	• Obsolescence in airconditioning units – this resulted in frequent failure of the airconditioners.
East London	• The UPS is on BYPASS operation due to mains input tolerance. A solution is sought for replacement of the AVR to stabilise/regulate the mains input.
Cape Town	• Mechanical breakdown in March.
Skukuza	• Skukuza radar – down due to disconnection of Eskom power source.
LDN	• Based on the data availability analysis, major breakdowns affecting data availability for this period were identified as primarily electrical power supply, as well as the communication link and computer network failures.
ARS	• The challenges with the ARS network include a shortage of spares and network communication failure.

3.1.4 Achievements and Highlights

The highlight for the year was the demonstration of capabilities and competencies by SAWS technologists and specialists with the continuous efforts to maintain the infrastructure at all costs. Radar network availability increased from 64% to 91.89%, the maintained LDN availability increased from 91% to 92% and Surface Observation to 87% for AWSs and 82% for ARSs.

3.1.5 Opportunities

The completion of a number of critical projects laid a good foundation to continue building a sustainable infrastructure for SAWS. The creation of a long-term infrastructure management plan is critical and will improve the management of current as well as future infrastructure.

Planned current and future projects include:

Table 10: Planned current and future projects.

PROJECT NAME	SHORT DESCRIPTION & BENEFIT
George S-band Radar Relocation	Radar business case, network optimisation.
Upgrade of LDN Sensors	Procurement of 6 upgrade kits for LDN sensors.
Procurement and installation of Palisade Fencing at identified sites	To enhance the security of remote LDN sites by protecting equipment and people working on site.
Procurement and installation of Security Cameras at identified sites	To enhance the security features of the un-manned Lightning Detection Network sites.
Procurement of 5 external UPS systems and installation of 3 of them (two spare units)	To provide back-up power to remote LDN sites.
Upgrade of Standard AWS sites to CR310	Upgrade of problematic sites around the country and also stolen units.
Procurement of Bulk spares for infrastructure (AWS/ARS)	Procurement of various spares for infrastructure to ensure availability and reliability.
Mossel Bay X-band radar relocation to George	Restoration and transportation of the Mossel Bay mobile X-band radar to George Weather Office.
Radar Dome refurbishment	Refurbishment of all radar domes including obstruction lights and day-night switches for 15 radar sites.

PROJECT NAME	SHORT DESCRIPTION & BENEFIT
Radio interference filtering	Installation of C-Band receiver band pass filters for De Aar, Cape Town and Skukuza radars.
AVR installation	Installation of Automatic Voltage Regulators for nine radar sites.
UPS redeployment	Radar site UPS to be refurbished and redeployed as part of the optimisation of SAWS infrastructure.
Radiation levels measurements	Conduct radiation measurements for 15 SAWS radar sites.
Upper-air	Procurement of supply and installation of upper-air setup balloon room.
Modernisation	Modernisation of 42 stations.
Security of radar sites	Phase 2.
CMMS	CMMS software purchase, setup, training and support.
Procurement and Upgrade of 10 LDN sensors	Continue sensor upgrades on the LDN network.
Technology Inter-comparison and integration	Market search for alternative technologies to be integrated on the network to avoid dependencies on only one technology and provider.
Procurement and installation of a generator	Procurement and installation of electrical back-up generator for the Mafikeng Weather Office.
Surface observation Infrastructure Modernisation Upgrade of 15 Weather Office AWSs from CR10X to CR1000	Procurement, assembly, installation and commissioning.
Upgrade of 60 AWS network from CR10X to CR310	Procurement, assembly, installation and commissioning.
Upgrade of 366 Manual Rainfall Stations	Procurement, assembly, installation and commissioning.
Supply and installation of two Upper- Air stations (Hogan Hydrogen Generator) and 2 vessels	Procurement and installation of 2 hydrogen generators.
Dual polarisation Upgrade/ Mid-life upgrades	Upgrade of 3 S-Band Radars into dual polarisation (Irene, Durban, Mthatha).
UPS installation	Supply and installation of UPS in Skukuza for radar.

3.2 Global Atmosphere Watch

The Global Atmosphere Watch (GAW) programme of SAWS assists the South African government in fulfilling a number of international conventions which they are signatory to, including, amongst others, the United Nations Framework Convention on Climate Change (UNFCCC), Interlnational Panel on Climate Change (IPCC), the Montreal Protocol, and Mina Mata Convention. The programme supports the initiative of governments through the monitoring of changes in the Earth's atmospheric composition, to inform policy direction. Stakeholders who make use of data that emanates from the SAWS' observation infrastructure are dependent on the effective performance of these observation systems.

The Cape Point GAW station forms part of an integrated global network of 30 similar stations, spread across the globe under the WMO GAW Programme. Trace gases and greenhouse gases are being monitored as background or reference levels to monitor the greenhouse gas loading in the atmosphere.

During the reporting period, the SAWS GAW programme, which is made up of the Cape Point GAW station as well as the Regional GAW stations, achieved 89.93% availability of data recovery.

3.3 Information and Communication Technology system availability

The Information and Communication Technology (ICT) department is guided by the SAWS Integrated Service Strategy (ISS) and Information and Communication Technology Master System Plan (ICT MSP) Roadmap Execution Plan to support, drive and enable the strategic objectives of SAWS across its value chain.

The ICT MSP Roadmap identified technically related initiatives and challenges that the SAWS needed to address, including:

- Define and rollout an Integrated Data Management Platform;
- Define and implement Enterprise Architecture (including Integration Architecture, Infrastructure and Application Modernisation and ICT Operating Model) model for the South African Weather Service;
- Define and implement an Integrated Risk and Compliance tool;
- Define and implement Process Management Strategy, Tool Options and Repository;
- Implementation of Enterprise Resource Planning;
- Implementation of an end to end Infrastructure and Application Monitoring Solution; and
- Implementation of an Integrated Unified Communications System (PABX, Video Conference, Audio and Visual and Office 365).

The SAWS acknowledged the increasing need for ICT to drive innovation through disruptive technologies, automating business processes and improving service delivery. Key strategic initiatives seeking to improve the capacity and capability of ICT were undertaken during the year under review to take advantage of the identified opportunities and address some of the challenges, including:

- The completion of infrastructure replacement;
- The implementation of the Enterprise Resource Planning;
- Redefining the SAWS API for its Web Portal and new mobile application development;
- Completion of proof of concept on cloud computing as a possible replacement for the High-Performance Computer (HPC) used primarily for numeric weather prediction and used as input HPC Business Case;
- As part of SharePoint deployment in SAWS, the SHEQ and TQM management solutions were implemented. This forms part of the development of the Intranet within SAWS, which will include document management and process flow engineering;
- Approval of the development of the Data Management System and development of the Terms of Reference; and
- Security Awareness Campaigns on Cyber Infrastructure performed internally at SAWS.

The following initiatives were also started and will be completed in the following financial year (2020/21):

- Replacement of the Forecasting Software used by SAWS;
- Replacement and upgrading of the Radar; and
- Implementation of the Integrated Unified Communication System (PABX, Audio and Visual and Video Conference with Office 365).

The ICT system availability was reported as part of the SAWS Annual Performance Plan as indicated in Table 11 below:

Table 11: ICT System Availability.

STRATEGIC OBJECTIVE 3.1: OPTIMAL MANAGEMENT OF INFRASTRUCTURE - ENSURE OPTIMAL INFRASTRUCTURE AND SYSTEMS UPTIME OF OBSERVATIONS, INFORMATION DISSEMINATION AND EXCHANGE THAT ENABLES SAWS TO ACHIEVE ITS MANDATE						
MO	TARGET	Q1 ACTUAL	Q2 ACTUAL	Q3 ACTUAL	Q4 ACTUAL	COMMENT
4.6	96% ICT system availability	99.2%	99.5%	99.4%	99.3%	The ICT system availability is a combined index, taking into consideration the Wide Area Network, Server Infrastructure and HPC availability.

3.4 Air Quality Stations available on the South African Air Quality Information System

The SAWS is the custodian of the South African Air Quality Information System (SAAQIS) and as such is responsible for the hosting, operation and maintenance of the SAAQIS to ensure access to air-quality information for all users such as the public, business, industry, government authorities, non-government organisations etc. Stakeholders that make use of the information available on the SAAQIS depend on the constant availability of the website as well as the accuracy and reliability of the information therein.

Leo de Veer, Air Quality Services Chief Technician, engaging with some scholars at the WBPA-AQMP awareness campaign.

The scholars from Igugulabasha Primary listening attentively.

Students from Igugulabasha Primary participating in a demonstration of Meteorological equipment.

In addition to being the custodian of the SAAQIS, SAWS is also responsible for the operation and maintenance of the following National Priority Area ambient air quality monitoring networks:

- Vaal Triangle (6 stations);
- Highveld (5 stations); and
- Waterberg (4 stations).

Despite several logistical and electricity challenges facing the operation of these air quality monitoring networks, greater than 80% data availability was achieved for the reporting period for all three networks. These networks experienced intermittent power losses due to the nationwide load shedding, while the operation of some stations was ceased due to theft and vandalism. This, coupled with instrument failures as a result of ageing instruments, had a negative impact on the data recovery for the period. Various interventions were implemented to improve station operation during this period, such as the upgrade of station security measures; the development of network recapitalisation plans; the replacement of station shelters; the installation of new logging systems to allow for remote instrument diagnostics and "near real time" data transmission to facilitate early faulty detection and response.

During this period SAWS hosted numerous environmental outreach/community awareness programmes for various stakeholders such as students, industry role players and municipalities on air pollution and its related impacts on human health and the environment. Grade 4 to 7 scholars from Igugulabasha Primary school were hosted at the Irene weather office on 28 August 2019. The school visit also covered environmental solutions and live demonstrations of air quality equipment and data. The SAWS air quality team furthermore participated in an Air Quality Awareness Campaign as part of the implementation of the Waterberg-Bojanala Priority Area (WBPA) Air Quality Management Plan on 5 September 2019 at the Backenburg stadium in Mogalakwena. In addition to raising awareness on air pollution and its health impacts, the operation of an ambient air quality monitoring station and the SAAQIS mobile APP were demonstrated to attendees.

Programme 4: Administration (Including Corporate and Regulatory Services)

Purpose:

Provide leadership, strategic, centralised administration, executive support, corporate services, and facilitate effective cooperative governance, international relations and environmental education and awareness

4.1 Sound Corporate Governance - Provide Business management and leadership

Commercial Revenue

The South African Weather Service Act, 2001 (Act No 8 of 2001 as amended), allows the organisation to raise revenue from commercial activities and to supplement income streams received from Government and the Aviation Sector.

The SAWS follows an Integrated Services Strategy, which embodies the interaction or integration of various functional areas to maximise economies of skill and scale, creating focus and addressing the challenge of duplication of effort and the building of services.

Senekal outreach March 2020.

The Integrated Services Model enables the production of tailored products and services for users to make informed decisions and reduce risks linked to weather related outcomes. A future focused on the increased need for information and understanding as well as concerns about the potential impacts on climate change, enabled collaborations between scientists, industry experts and strategic partnerships to deliver specific products and services in various sectors such as water; agriculture; energy; financial; mining; retail; government and logistics.

To meet the challenges ahead, it is imperative that governments, institutions, businesses and the public are supported with the best weather and climate services. By following the PFMA processes, the organisation has set up relationships with strategic partners, each with unique capabilities and positioned to reach all South Africans. In addition, the exploration of various revenue models and pricing strategies will assist the organisation to improve its pricing and revenue streams going forward.

4.2 Adequate, Appropriately Skilled, Transformed and Diverse Workforce - Develop programmes which create a supportive environment for high performance, employee wellness, career development, attraction and retention

See Part D: Human Capital Management

4.3 Stakeholder Engagement Network Development - Engagement of stakeholders for mutual benefit relationships

4.3.1 Stakeholder engagement plan developed and implemented

For the period under review, the organisation collaborated with several strategic partners for the development of products and solutions. In terms of international cooperation, SAWS initiated discussions with the National Oceanic and Atmospheric Administration (NOAA), Deutscher Wetterdienst (DWD) and China Met Agency (CMA) where Memoranda of Understandings (MoUs)

were facilitated for signature in the 2020/21 financial year. These endeavours will ensure that SAWS increases its profile and position as a scientific council. An agreement with the UK Met Office was also signed for the Unified Model (UM) during the period under review.

Regionally, SAWS is in a process of signing agreements with the Maasai Mara University (MMARAU), Kenya Water Institute (KEWI) and the Kenya Meteorological Department (KMD) to jointly implement projects under a collaborative fund by the Water Research Council for various scientific disciplines and application research.

Nationally, several new MoUs were signed with various strategic partners including the Council for Scientific and Industrial Research (CSIR), the Agricultural Research Council (ARC), the Water Research Commission (WRC), the University of KwaZulu-Natal (UKZN) and the University of Venda (Univen). These MoUs cover a wide range of cooperative areas of atmospheric research and applications.

The SAWS has signed agreements with the Department of Science and Innovation (DSI), Department of Water and Sanitation (DWS), and the KwaZulu-Natal Department of Economic Development, Tourism, and Environmental Affairs. These agreements enabled SAWS to collaborate and develop several products and solutions including early warning systems, application research, and monitoring of projects.

The third Science-Stakeholder Conference, which was to be held on 23 and 24 March 2020, was postponed to the 2020/21 financial year due to the COVID-19 pandemic.

Table 12: Stakeholder Relations activities: 2019/20.

EVENT	DATE	VENUE	DETAILS
PARTNERSHIPS WITH DISTRICT MUNICIPALITIES AND COMMUNITY OUTREACHES			
Klerksdorp and Clarens	21 August 2019	Klerksdorp, North West	The workshop trained local disaster managers on the new severe weather warning service that evolves the warning message from *"What the weather will be" to "What the weather will do".*
Impact-based Severe Weather Warning System workshop	25 February 2019	Clarens, Free State	
Dr Kenneth Kaunda District Municipality community outreach	4 September 2019	Matlosana, North West	SAWS partnered with district municipalities and provincial governments to reach vulnerable communities which are greatly affected when severe weather strikes. The events saw attendance figures of 400 and 700 respectively.
Thabo Mofutsanyane District Municipality community outreach	27 February 2020	Senekal, Free State	
Second Annual Disaster Management School Competition	12 February 2020	Polokwane, Limpopo	SAWS and the Capricorn District Municipality hosted the school competition which aims to promote the knowledge of disaster risk reduction in schools.
Rustenburg Expo	25 to 28 February 2020	Rustenburg, North West	The Bojanala District Municipality held a four day expo with over 2000 learners in attendance.
CAREER EXHIBITIONS AND WEATHER AWARENESS			
Science Tube	13 to 17 May 2019	Thohoyandou, Limpopo	SAWS has participated in this event for the past 10 years which exposes the world of science to village learners.
Rural Education Festival	22 to 25 July 2019	Giyane, Limpopo	Introduces rare skills solutions to learners in marginalised rural schools.
MoU Agreement with EDTEA	21 February 2020	Pietermaritzburg, KZN	SAWS signed an MoU with the KZN Provincial Department of Economic Development, Tourism and Environmental Affairs (EDTEA) for the King Shaka office to participate in a weather awareness roadshow.

EVENT	DATE	VENUE	DETAILS
National Science Week Launch and partnership with DST	27 July 2019	Kimberley, Northern Cape	The SAWS partnered with the Department of Science and Technology to produce scientific. material that was distributed to 103 grant holders of the South African Agency of Science and Technology Advancement (SAASTA). Science exhibitions held across the country in line with the NSW theme of: "facing the harsh realities of Climate Change".
National Science Week Alignment rules	29 July 2019 to 3 August 2019	Polokwane, Kimberley, Bloemfontein	
AVIATION			
Aviation Development Africa expo	27 April 2019	Soweto, Gauteng	SAWS forecasters participated in Soweto's first Aviation Expo.
Newscastle Airshow	1 June 2019	Newcastle, KZN	The event aims to expose attendees to the world of aviation.
The International Civil Aviation Day (ICAD)	7 December 2019	Polokwane, Limpopo	The purpose of the day is to recognize the importance of aviation, especially international air travel, to the social and economic development of the world.
SA Agulhas Open Day	8 to 9 August 2019	East London, Eastern Cape	The event seeks to attract and educate communities about careers in the marine sector.
DISASTER RISK REDUCTION			
DMISA Conference	18 to 29 September 2019	Mossel Bay, Western Cape	The conference brought together a diverse range of disaster management practitioners to share skills, information and knowledge. The SAWS exhibition stand was awarded the best exhibitor at the close of the conference.
30th anniversary of the International Disaster Risk Reduction (IDDR)	5 to 6 December 2019	Bloemfontein, Free State	The day celebrates how people and communities around the world are reducing their exposure to disasters and raising awareness about the importance of reining in the risks that they face.

4.3.2 International Relations engagements

During the 2019/20 financial year, the organisation continued to fulfil its regional and international obligations. Additionally, it utilised its designated regional institutions and expertise for meteorological advancement in the region. SAWS participated in regional and international engagements, in order to address the strategic intent of the organisation and to deliver on its core mandate. During this reporting period, 67 SAWS personnel participated in regional and international engagements, which were both strategic and technical in nature.

Table 13: International and Regional Relations Engagements

INTERNATIONAL RELATIONS ENGAGEMENTS	DATE AND VENUE	ACHIEVEMENTS
WMO		
18th WMO Congress	3 to 14 June 2020 Geneva, Switzerland	• Participation in deliberations of the Earth Systems Governance approach with South Africa advocating the continent's plight and the implications of these reforms in developing and least developed countries. • Participation in the election of the WMO President and Vice Presidents for the Infra-structure and Services Commissions with Tanzania becoming the third Vice President. • The retention of the two WMO EC seats for the SADC region and their allocation to Namibia and Mozambique.

INTERNATIONAL RELATIONS ENGAGEMENTS	DATE AND VENUE	ACHIEVEMENTS
WMO reform of its governance structure		• SAWS aligned its processes according to the prescripts of the WMO reforms by nominating a South African official to serve in the WMO Research Board. • The country confirmed its Hydrological Adviser, in efforts to assist WMO, at national level, to enhance and profile the role of hydrology within the integrated earth-system approach. • The country nominated numerous South African scientific experts to serve in the WMO Infrastructure and Services Commissions.
23rd session of the WMO Regional Association I Tropical Cyclone Committee (RA I TCC) for the South-West Indian Ocean	Mozambique October, 2019	• As the Regional Specialised Meteorological Centre (RSMC), SAWS provided key technical guidance to the SADC countries.
WMO Dobson-spectrometer workshop	Pretoria, South Africa October, 2019	• During the workshop, the instruments underwent multiple calibration periods; data was obtained and processed; and new instrument calibration levels were established. Better practices would be implemented from this calibration process for future calibration operations. • The workshop attracted the United States of America, Germany, Kenya and Botswana.
WMO Leadership and Management of National Meteorological and hydrological Services in Africa Conference	Boksburg, South Africa November, 2019	• In efforts to enhance the positioning of the country regionally and internationally SAWS co-hosted the Leadership Conference with the WMO. • 41 countries out of 54 (76%) participated in this conference. • SAWS was able to display its capabilities and abilities in the SADC region and the continent.
Third Steering Committee Meeting of the Southern Africa Regional Flash Flood Guidance System	17 to 19 December 2019	• The objectives were to review and analyse the project status; provide feedback on the system operational use in the region; and to discuss the development and implementation of the SARFFGS enhancements for the next phase of the project.
MEMORANDA OF UNDERSTANDING (MoUs)		
MoUs	3 to 14 June 2019 Geneva, Switzerland	• Engaged with the American and German Permanent Representatives (PRs) on the expired MoU and the intent for their review and signing. • SAWS and the UKMO agreed on the collaboration for the development of a proposal to the Green Climate Fund, seeking financial support for South Africa. • The UKMO Chief Executive offered its support to SAWS, to ensure that the objectives of the Gough Island project are achieved. • Engagement with the China Meteorological Agency (CMA) on the possibility of collaborating at a technical level was embraced by both organisations.
	Post WMO Congress of June 2019	• Both draft MoUs have been exchanged with Germany (DWD) and America (NOAA) for vetting processes. Both MoUs are ear-marked for signing in the beginning of the 2020/21 Financial Year.
REGIONAL		
SADC Committee of Ministers meeting	16 to 20 September 2020 Dar es Salaam, Tanzania	Apprised the Ministers with; • the harmonisation of various strategies, the MASA Strategy Plan with the SADC Regional Infrastructure Development Master Plan (RIDMP). • Progression made by SADC Members and their NMSs with regards to their compliance with WMO/ ICAO QMS; the signing of the AMCOMET Constitution and ratification of the Minamata Convention. • Internal issues at MASA which required the ministerial intervention.
AGRHYMET West Africa Regional Centre embarked on a technical visit	6 to 17 May 2019 Pretoria, South Africa	• The aim of the technical visit was to learn about Numerical Weather Prediction (NWP). SAWS also assisted AGRHYMET to create a domain for West Africa and run a simulation using the Centre for High Performance (CHPC) cluster with the Weather Research and Forecasting (WRF) model.

INTERNATIONAL RELATIONS ENGAGEMENTS	DATE AND VENUE	ACHIEVEMENTS
SADC Cyber-Infrastructure workshop	August 2019	• The project aimed at improving weather and climate early warning systems over Southern Africa. • The project included Botswana, Mozambique, Namibia, South Africa, Tanzania and Zambia. • The workshop served as a good platform to improve collaboration; and enhance project resource mobilisation processes in the region.
Scheduled to receive two incoming visits both cancelled due to COVID-19 outbreak	16 to 18 March 2020 Pretoria, South Africa	• The first visit was strategic in nature, for the Ugandan Board delegation to benchmark on SAWS cost recovery processes for aeronautical services. • The second visit from the Tanzania Civil Aviation Authority for "On the Job Training (OJT)" in line with the requirements of ICAO which stipulate that officials performing safety oversight obligations on behalf of the State, should undergo OJT with an experienced inspector before they could fulfil their tasks unsupervised.
WMO familiarisation tour of Head of the Zimbabwe Meteorological Department (ZMD) and the Permanent Representative (PR) of Zimbabwe	30 September to 1 October 2019 Pretoria, South Africa	• The visit aimed at empowering and capacitating the newly designated PRs, through benchmarking and learning of best practices from other NMSs.
AVIATION		
40th ICAO Assembly	October to November 2020 Montreal, Canada	• South Africa's re-election to the ICAO Council for another three-year term. • Represented the aeronautical meteorology to advance the country's interest and advocate the plight of the entire continent.
WMO Aviation Research Demonstration Project (AvRDP) Seminar	August 2019 Pretoria, South Africa	The main outcomes were the resolutions: • to develop a publication on the achievements of the project; • the development of a guidance document that could be provided to all WMO member states that aspire to enhance their meteorological aviation services; and • the development of a vision statement for the next aviation demonstration project planned for 2020-2023.
Aviation Forecasting Training	March 2020 Pretoria, South Africa	• The RTC-Pretoria received Namibia Meteorological Service (NMS) personnel for the three week aviation forecasting training. However, due to the COVID-19 outbreak, the training was cancelled and a Namibian personnel returned to their country.

4.3.3 Cumulative Advertising Value Equivalent (AVE)

Advertising Value Equivalent is the value of SAWS publicity in the media, should we have had to pay for that. During the report period the organisation exceeded expectations in reaching main stream media targets mainly due to additional public good services that were initiated during a pilot phase with broadcaster eNCA and the quantification of value with the broadcaster, SABC. The target of R 155 million was exceeded and R 294 370 595 was achieved.

SAWS exhibitors at the leadership conference.

THE SAWS PERFORMANCE INFORMATION FOR 2019/20 IS ALIGNED TO THE PERFORMANCE INDICATORS AND TARGETS IN THE ORGANISATION'S ANNUAL PERFORMANCE PLAN 2019/20

Programme 1: Weather and Services

OBJECTIVE STATEMENT	KEY PERFORMANCE INDICATOR	ANNUAL TARGET 2019/20	ANNUAL RESULT	COMMENT ON DEVIATION
STRATEGIC OBJECTIVE 1.1: WARNINGS, ALERTS AND ADVISORIES				
Provide timeous and accurate impact based early warnings, alerts and advisories to safeguard life and property against the impact of severe weather on land, oceans and in the air	Percentage of national weather (FPZA41) available	98% National weather (FPZA41) available	Achieved • 98% FPZA41 available	The overachievement is due to the expected periodic network and transmission failures being minimal during the period. Stringent submission timelines for product implemented to ensure availability.
	Percentage of Aerodrome warnings accuracy	98% Percentage of Aerodrome warnings accuracy	Partially Achieved • 97% Aerodrome warning accuracy	Forecasters were able forecast more accurately than anticipated. Stable weather over winter months contributed to increased forecast accuracy.
	Percentage accuracy of meteorological information for flight planning and en-route operations (TAF)	90% Percentage accuracy of meteorological information for flight planning and en-route operations (TAF)	Achieved • 94% TAF accuracy	Forecasters were able forecast more accurately than anticipated. Stable weather over winter months contributed to increased forecast accuracy.
	Percentage availability of Marine (SOLAS)	95% Availability of Marine (SOLAS)	Achieved • 96% SOLAS availability	The overachievement is due to the expected periodic network and transmission failures being minimal during the period. Stringent submission timelines for product implemented to ensure availability.

Programme 2: Research and Innovation

OBJECTIVE STATEMENT	KEY PERFORMANCE INDICATOR	ANNUAL TARGET 2019/20	ANNUAL RESULT	COMMENT ON DEVIATION
STRATEGIC OBJECTIVE 2.1: RESEARCH				
Generate new scientific insights in atmospheric and related sciences in collaboration with relevant stakeholders. Expand the existing knowledge base and intelligence related to climate change	Number of Research outputs (publications, articles, conference papers)	45 Research outputs	Achieved • 52 Research Outputs	Overachievement due to increased peer-reviewed conference papers presented at conferences attended.
STRATEGIC OBJECTIVE 2.2: SOLUTION DEVELOPMENT				
Provision of innovative meteorological and related products and services through the development and implementation of weather-smart products and service plan	Number of Solutions developed	5 Solutions developed	Achieved • 5 Solutions developed	None. Target achieved.

Programme 3: Infrastructure and Informations Systems

OBJECTIVE STATEMENT	KEY PERFORMANCE INDICATOR	ANNUAL TARGET 2019/20	ANNUAL RESULT	COMMENT ON DEVIATION
STRATEGIC OBJECTIVE 3.1: OPTIMAL MANAGEMENT OF INFRASTRUCTURE				
Ensure optimal infrastructure and systems uptime of observations, information dissemination and exchange that enables SAWS to achieve its mandate	Percentage of Surface observation infrastructure availability (AWS, ARS)	85% Surface observation infrastructure availability (AWS, ARS)	Achieved • 85% surface observation infrastructure availability	None. Target achieved.
	Percentage of GAW infrastructure availability	90% GAW infrastructure availability	Partially Achieved • 86% GAW infrastructure availability	Challenges: Load shedding resulting in multiple instrumentation failure. In addition, ageing infrastructure, as well limited capital expenditure budget negatively impacted optimal operation of GAW facility. Corrective measures: Backup power acquisition and GAW Business Case implementation.

OBJECTIVE STATEMENT	KEY PERFORMANCE INDICATOR	ANNUAL TARGET 2019/20	ANNUAL RESULT	COMMENT ON DEVIATION
Ensure optimal infrastructure and systems uptime of observations, information dissemination and exchange that enables SAWS to achieve its mandate (continued)	Percentage of Remote sensing observation infrastructure availability (Radar)	80% Remote sensing observation infrastructure availability (Radar)	Achieved • 92% Radar availability	Radar network availability surpassed target as a result of contracts put in place to ensure increased capacity of diesel tanks for back-up power, improved communications and air-conditioning for the infrastructure. Technical personnel were trained by the radar infrastructure manufacturer to improve response to challenges. This led to overachievement on target set.
	Percentage of Remote sensing observation infrastructure availability (LDN)	90% Remote sensing observation infrastructure availability (LDN)	Achieved • 92% LDN availability	Optimisation of peripheral equipment for power and communication stabilised the network. Regional deployment of additional Technologist and Technicians assisted with faster response time.
	Percentage of Upper air observation infrastructure availability	80% Upper air observation infrastructure availability	Partially achieved • 59% Upper air observation infrastructure availability	Challenges: Springbok generator faulty since February 2020. Durban- and Gough Island infrastructure remained non-operational for majority of the financial year. Corrective measures: Gough Island infrastructure will be replaced in the next Gough Island take-over voyage. Evaluation for supplier to install new upper air infrastructure concluded and appointment to follow.
	Percentage of ICT system availability	96% ICT system availability	Achieved • 99% ICT system availability	WAN technology upgrade and bandwidth increase contributed to network stability and reliability. Old and out of warranty servers and storage replaced. This led to increased availability on the server infrastructure.
STRATEGIC OBJECTIVE 3.2: QUALITY DATA				
Provide quality data meeting minimum data requirements	Percentage of Air quality stations available on SAAQIS	90% Air quality stations available on SAAQIS	Achieved • 98% Air quality stations available on SAAQIS	The over achievement is attributed to limited/reduced downtime of equipment at the stations.

Programme 4: Administration (including Corporate and Regulatory Services)

OBJECTIVE STATEMENT	KEY PERFORMANCE INDICATOR	ANNUAL TARGET 2019/20	ANNUAL RESULT	COMMENT ON DEVIATION
STRATEGIC OBJECTIVE 4.1: SOUND CORPORATE GOVERNANCE				
Provide Business management and leadership	Current ratio for Liquidity	1.5 liquidity ratio	Partially achieved • 0.75 Liquidity Ratio	Challenges: Mainly due to increase in cash and cash equivalents, trade payables, unspent government grants and short-term employee benefits.
	Percentage Expenditure on affirmative procurement	65% Expenditure on affirmative procurement	Achieved • 95% local expenditure on affirmative procurement achieved	The procurement spend was based on promoting Small, Medium and Micro Enterprises (SMME), especially Black woman and Black owned enterprises.
	Level of B-BBEE	B-BBEE Level 7	Not Achieved	Corrective measures: B-BBEE Task team established and formally appointed by CEO. Employment Equity focus towards PWDs and targeting of TVET Colleges. Spending on management training through partnership with universities will be implemented to improve the timely execution of identified development interventions.
	Commercial revenue	R 36.19 m Commercial revenue	Partially Achieved • R35.55m Commercial revenue	Challenges: Installation of equipment for key clients was delayed. NetSuite implementation impacted on processes to load orders and release invoices. Corrective measures: Greater client base expected from strategic partners.
STRATEGIC OBJECTIVE 4.2: ADEQUATE, APPROPRIATELY SKILLED, TRANSFORMED AND DIVERSE WORKFORCE				
Develop programmes which create a supportive environment for high performance, employee wellness, career development, attraction and retention	Percentage of Attrition rate	8% Attrition rate	Achieved • 6% attrition rate	The implementation of salary parity assisted reduction and management of employee turnover. Realigning salaries for core employees to be competitive with the market offers contributed to overachievement.
	Percentage of Workplace skills plan targets met	95% Workplace skills plan targets met	Not achieved • 30% WSP target met	Challenges: Procurement of required WSP Training. Some training courses were procured, however not enough time left for training to take place. National Lockdown also hampered execution. Corrective measures: Training already procured will be carried over and executed in 2020/21.

OBJECTIVE STATEMENT	KEY PERFORMANCE INDICATOR	ANNUAL TARGET 2019/20	ANNUAL RESULT	COMMENT ON DEVIATION
STRATEGIC OBJECTIVE 4.3: STAKEHOLDER ENGAGEMENT NETWORK DEVELOPMENT				
Engagement of stakeholders for mutual benefit relationships	Percentage stakeholder development plan implemented	85% Stakeholder development plan implemented	Achieved • 89% stakeholder development plan implemented	Engagements from Regional offices in the first quarter were above expectations. Further enthusiasm was displayed during the National Science Week where multiple Weather Offices and departments were involved in stakeholder engagements.
STRATEGIC OBJECTIVE 4.4: CORPORATE COMMUNICATION/BRANDING				
Development and maintenance of various platforms for engagement with stakeholders to extend the reach and increase awareness of the SAWS brand	Advertising value equivalent (R value million) (cumulative)	R 155 m Advertising value equivalent	Achieved • R 294 m AVE	The additional service to ENCA and additional monitoring of AVE at the SABC during the weather programme contributed to overachievement.

Governance

PART C

1. Introduction

The Board of the South African Weather Service is established in terms of section 5 of the South African Weather Service Act, 2001 (No. 8 of 2001) as amended and its mandate is derived from section 6 of the Act. The Board is charged with ensuring that the organisation is governed effectively and within the prescripts of relevant legislative and regulatory frameworks. The Board also provides strategic direction, leadership and vision to SAWS in a way that enhances the Shareholder value and ensures the long-term sustainable development and growth of the organisation.

1.1 Shareholding

The Government of the Republic of South Africa is the sole shareholder of SAWS and the shareholder representative is the Minister of Environment, Forestry and Fisheries. Although SAWS is not required in terms of Treasury Regulations to conclude a Shareholders' Agreement, such was concluded and submitted to the Minister in the course of 2019/20. This was in line with a recommendation made in the Environmental Sector Micro-Governance Review Report and the agreement ensures that oversight, strategic and governance arrangements between the Shareholder and the entity are clearly defined.

1.2 Legislative Framework

The SAWS is established in terms of the South African Weather Service Act, 2001 (No. 8 of 2001) as amended in 2013, (also referred to as the SAWS Act) and its mandate is derived from section 3 of the Act. The Public Finance Management Act, No.1 of 1999 (PFMA) and National Treasury Regulations published in terms thereof serve as the authority for the organisation's financial reporting requirements. Policies have been put in place to ensure that there is compliance with all relevant legislation.

2. Portfolio Committees

The Board respects the supremacy of the letter and spirit of the Constitution of the Republic of South Africa and continues to abide by the rules, guidance and directives of Parliament, more specifically those of the Parliamentary Portfolio Committee of Environment, Forestry and Fisheries and of the Standing Committee on Public Accounts (SCOPA).

The Annual Report for the 2018/19 financial year, including the Annual Financial Statements, was tabled before the Portfolio Committee within the timelines prescribed by the provisions of the PFMA and Treasury Regulations. The Quarterly Performance Reports for the first three quarters of the 2019/20 financial year were also tabled before and discussed by the Portfolio Committee during this reporting period.

The Chairperson of the Board and designated officials attended three meetings of the Portfolio Committee during the reporting period to, among other things, discuss the quarterly performance of the entity, present the 2018/19 annual report as well as to provide progress on governance and human capital matters raised by the Committee:

NO.	DATE
1.	3 September 2019
2.	10 October 2019
3.	19 November 2019

3. Board of Directors

3.1 Composition of the Board

Section 2(2) of the SAWS Act, provides that SAWS acts through a Board of Directors appointed by the Minister in terms of Section 5 of the Act. During the reporting period, the Board consisted of a maximum of 10 Directors including the Chief Executive Officer who serves as an Executive Director *ex officio.*

The Directors have extensive experience across a diverse range of sectors, which accordingly enables the Board to provide balanced and independent advice and judgment in the decision-making process.

3.2 Role and function of the Board

The Board is the accounting authority of SAWS in terms of the Public Finance Management Act 1 of 1999 (PFMA). Deriving from the SAWS Act, Treasury Regulations issued in terms of the PFMA, other relevant legislation and prevailing governance frameworks and guidelines, the Board charter sets out clear direction with regards to the role and responsibilities of the Board, and composition and requirements for Board meetings. These responsibilities include:

a. Ensuring the financial viability and development of SAWS commercial services;
b. Ensuring an efficient, cost-effective and high-quality weather service;

c. Setting policies, standards and objectives within the framework issued by the Minister and ensuring that Executive Management implements these policies, standards and objectives;
d. Facilitating succession and providing guidance in the appointment of senior managers;
e. Ensuring that the Weather Service has adequate systems of internal control, both operational and financial;
f. Monitoring the performance of the Weather Service and adjusting the conditions of service of the personnel with due regard to the applicable labour legislation;
g. Recommending any necessary budget proposals or adjustments and submitting them to the Minister;
h. Setting policies for recruitment and training and for the transformation of the Weather Service;
i. Approving a business plan for the Weather Service annually for the next three years and submitting it to the Minister for final approval;
j. Ensuring that the majority of the South African population benefits from the public goods services of the Weather Service; and
k. Performing any other function assigned to it by the Minister.

The Board and Executive Management work closely together in determining SAWS' strategic approach. Through policies approved by the Board as well as the delegation of authority framework, the Acting Chief Executive Officer continued to implement strategy and managed the daily operations of the organisation, with the support of the Executive Management Team. The Directors are apprised of implementation progress through reporting at Board Committee and Board meetings as well as regular communications with Executive Management, through the CEO.

In addition to the provision of leadership and strategic direction to the entity, the Board through its Committees, which it has established to assist in providing oversight to various aspects of the entity, as reported below, the Board provided leadership and was involved in the following:

3.3 Key matters requiring Board involvement

- SAWS Head Office Lease
- Public Protector's Report on the appointment of the Senior Manager Research and implementation of the remedial action related thereto
- Former Chief Executive Officer disciplinary process
- State Security Agency Report on root cause of disruptions (information leaks and whistleblowing) within the entity.

3.4 Stakeholder Engagement

- Presentation of quarterly reports and the 2018/19 Annual Report to the Portfolio Committee
- Response to Parliamentary Questions
- Hosting of the conference on Leadership and Management of African NMHSs
- Hosting the Minister of Environment, Forestry and Fisheries at SAWS, to familiarise her with SAWS Operations

During the reporting period the Board consisted of the following members:

Table 14: Board members.

NO.	NAME	DESIGNATION
1.	Ms Nana Magomola	Chairperson of the Board (non-executive director)
2.	Dr Phillip Dexter	Deputy Chairperson of the Board (non-executive director)
3.	Adv. Derick Block	Non-executive director
4.	Mr David Lefutso	Non-executive director
5.	Dr Mphekgo Maila	Non-executive director
6.	Ms Kelebogile Moroka-Mosia	Non-executive director
7.	Ms Sally Mudly-Padayachie	Non-executive director
8.	Dr Tsakani Ngomane	Non-executive director (DEA representative)
9.	Mr Itani Phaduli	Non-executive director
10.	Ms Feziwe Renqe	Non-executive director
11.	Dr Jonas Mphepya[1]	Executive director (ex officio)
12.	Mr Mnikeli Ndabambi[2]	Executive director (ex officio)

3.5 Attendance: Board Meetings

The Act stipulates that meetings of the Board must be held at least four times a year at such times and places as the Board may determine. The Board is also permitted in terms

1 **Appointed as Acting Chief Executive Officer on 23 September 2019 to 20 March 2020**
2 **Appointed as Acting Chief Executive Officer on 17 March to 17 September 2019 and re-appointed on 20 March 2020**

of the Act to hold special meetings. Meetings of the Board are scheduled in advance, as per the annual Board plan and special meetings are convened as specific circumstances dictate. During the year under review, the attendance record of the respective Directors was as follows:

Table 15: Attendance of meetings by board members.

MEMBER	29/04/19	30/05/19	10/07/19 (SPECIAL)	30/07/19	21/08/19 (SPECIAL)	09+10/09/19 (BOARD STRATEGIC PLANNING SESSION)	31/10/19	29+30/01/20
Mrs Nana Magomola (Chairperson)	x	✓	✓	✓	✓	✓	✓	✓
Dr Phillip Dexter (Deputy Chairperson)	✓	✓	✓	✓	✓	✓	✓	✓
Mr Jerry Lengoasa (Chief Executive Officer – ex officio)[3]	-	-	-	-	-	-	-	-
Mr Mnikeli Ndabambi (Acting Chief Executive Officer – ex officio)[4]	✓	✓	✓	✓	✓	✓	-	✓
Dr Jonas Mphepya (Acting Chief Executive Officer – ex officio)[5]	-	-	-	-	-	-	-	✓
Adv. Derick Block	✓	✓	✓	✓	✓	✓	x	✓
Mr David Lefutso	✓	✓	✓	✓	✓	✓	✓	✓
Dr Mphekgo Maila	✓	✓	✓	✓	✓	✓	✓	✓
Ms Kelebogile Moroka-Mosia	✓	✓	✓	✓	✓	✓	-	✓
Ms Sally Mudly-Padayachie	✓	✓	✓	x	✓	✓	✓	✓
Dr Tsakani Ngomane	x	✓	x		✓	✓	x	x
Mr Itani Phaduli	✓	✓	✓	✓	✓	✓	✓	✓
Ms Feziwe Renqe	✓	x	✓	✓	✓	✓	✓	✓

3.6 Board Committees

During the year under review, the Board continued with the following established Committees:

a. Audit and Risk Committee;
b. Human Resources and Remuneration Committee; and
c. Strategic Programmes Committee.

---

3 On leave of absence until resignation on 31 October 2019
4 Acting period as Chief Executive Officer expired in September 2019
5 Acting period as Chief Executive Officer commenced in September 2019

3.7 Audit and Risk Committee

The Audit and Risk Committee is a statutory committee of the Board, established in terms of section 77 of the PFMA, read with Treasury Regulation 27.1 published in terms of the PFMA. The Committee is accountable to the Board for the discharge of its responsibilities which include the following:

a. Reviewing and recommending for Board approval the SAWS budget for the financial year;
b. Monitoring SAWS financial performance (Management Accounts) against the approved Budget and Annual Performance Plan;
c. Reviewing the appropriateness of and compliance with accounting policies;
d. Reviewing the appropriateness of assumptions made by Management in preparing the Financial Statements;
e. Reviewing the significant accounting and reporting requirements and their impact on the Financial Statements;
f. Reviewing the integrity of financial reporting, including the Management Report to the Committee on important decisions taken during preparing the Financial Statements;
g. Reviewing the Annual Financial Statements for completeness and consistency with the prescribed accounting principles prior to recommending them for Board approval;
h. Reviewing, together with Management and the external auditors, the outcome of the external audit, including any significant issues identified;
i. Governance of risk;
j. Governance of Information and Communication Technology (ICT);
k. Monitoring internal controls and compliance;
l. Managing performance information;
m. Reviewing and approving the Internal Audit Plan budget, scope and any major changes to it, and ensuring that it covers the key risks and that there is appropriate coordination with the external auditor;
n. Ensuring that the external auditors provide an assurance report on the contents of summarised financial information;
o. Regularly reporting to the Board about Committee activities, issues and related recommendations;
p. Whistle blowing and reporting fraud; and
q. Monitor SAWS activities with regard to matters relating to:
    - social and economic development including the organisation's standing in terms of the goals and purposes of the aspects of the 10 (ten) principles of the United Nations Global Compact that are relevant to its mandate (working against corruption in all its forms, including extortion and bribery);
    - the Organization for Economic Cooperation Development (OECD) recommendations regarding anti-corruption.

During the year under review, the Committee reviewed its terms of reference in compliance with best practice corporate governance. In its review, the Committee considered the request made by the Shareholder that each entity reporting to the DEFF should incorporate in its structures, the Social and Ethics Committee (SET). The Board took a view that its various Committees should incorporate the responsibilities of the SET that are relevant to their various mandates. The ARC terms of reference now incorporate the oversight responsibility to ensure that the entity is in good standing in terms of working against fraud and corruption.

The Committee provided oversight, as mandated by the Board on the following aspects:

3.8 Key and Strategic Projects

- Monitoring of the entity's migration to the ERP system
- High Level Review of the state of the Finance and Supply Management Departments
- Investigations on alleged fraud and corruption

3.9 Compliance Requirements

- Unaudited and Audited Annual Financial Statements
- Auditor-General's Management Report
- Monitoring of quarterly performance against the 2019/20 Annual Performance Plan (APP)
- Tariff Review in as far as it impacts on revenue generation
- Quarterly Compliance Performance
- Broad Based Black Economic Empowerment (B-BBEE)
- Materiality Framework

3.10 Strategies, Frameworks and Policies

- Asset Management Policy
- Fleet Management Policy
- Business Continuity Management Policy
- Finance and Financial Administration Policy
- Strategic Risk Assessment
- External Audit Strategy
- Gifts Policy
- Conflict of Interests Policy

3.11 Performance Monitoring

- Quarterly financial performance, including implementation of additional cost containment measures
- Capital expenditure budget
- Risk Management
- Business Continuity Management
- Legal Costs
- Irregular, Fruitless and Wasteful Expenditure
- Internal Audit Performance against the Annual Internal Audit Plan
- Whistle blower reports
- Internal and external audit findings dashboard

During the 2019/20 financial year, the membership of the Audit and Risk Committee changed in line with changes in the Board as well as rotation of re-appointed directors to other Board Committees. The Committee held 5 meetings as follows:

Table 16: Meetings held by the Audit and Risk Committee.

MEMBER	15/04/19	29/05/19	22/07/19	29/07/19	21/08/19	22/10/19	24/01/20
Dr Phillip Dexter (Chairperson)[6]	✓	✓	✓	✓	✓	✓	-
Adv. Derick Block	✓	✓	✓	✓	✓	✓	✓
Mr Itani Phaduli (Chairperson)[7]	✓	✓	✓	✓	✓	✓	✓
Mr Gideon Labane (Independent Member)	✓	✓	✓	✓	✓	✓	✓
Mr Suren Maharaj (Independent Member)	x	✓	✓	✓	✓	✓	✓
Mr Thamsanqa Ndadana (Independent ARC member)[8]	-	-	-	-	-	-	✓

3.12 Human Resources and Remuneration Committee

The Committee is accountable to the Board for the discharge of its responsibilities which include the following:

a. Fulfilling all of its responsibilities related to governance and strategic leadership matters within its scope;
b. Overseeing the quality, integrity and reliability of SAWS Human Capital Management processes and strategy;
c. Assisting the Board in discharging its duties, thereby ensuring that SAWS has an approved Human Resource Strategy and that adequate human resource related policies and systems are in place in compliance with all applicable legislation, regulations and governance frameworks;
d. Ensuring that the SAWS Human Capital Strategy is aligned with SAWS business objectives;
e. Reviewing Human Capital Management policies and processes, including the adequacy of organisational staffing plans and compliance with occupational health and safety regulations;
f. Considering and making recommendations to the Board on remuneration policies for all levels of personnel; setting remuneration policies in line with responsibilities; and making recommendations to the Shareholder on the Board's Remuneration Framework should it be deemed necessary;
g. Scrutinising all benefits including pensions, benefits in kind and other financial arrangements to ensure that they are justified, correctly valued and suitably disclosed;
h. Overseeing performance management processes;
i. Facilitating succession planning for the position of Chief Executive Officer;
j. Monitoring implementation of the Annual Performance Plan and other Frameworks that fall within its scope;
k. Ensuring that SAWS fulfils its human rights and labour-related responsibilities emanating from the 10 Principles of the United Nations Global Compact and the OECD recommendations regarding anti-corruption;
l. Overseeing Management's implementation of key strategic programmes within the scope of the Committee;
m. Monitor the SAWS activities with regard to matters relating to social and economic development, including the company's standing in term of the goals and purposes of:
    - the 10 Principles of the United Nations Global Compact in as far as they relate to its mandate (Human Rights and Labour related principles);

6 Ceased being a member of the Committee and was appointed to the Strategic Programmes Committee of the Board with effect from 1 December 2019
7 Appointed as the Chairperson with effect from 1 December 2019
8 Appointed as an independent member with effect from December 2019

- the Employment Equity Act No 55 of 1998;
- good corporate citizenship including the organisation's promotion of equality, prevention of unfair discrimination;
- labour and employment, including the organisation's standing in terms of the International Labour Organization Protocol on decent work and working conditions as well as the SAWS' employment relations and its contribution towards the educational development of its employees; and
- Human Rights and Labour.

During the year under review, the Committee reviewed its terms of reference to include the responsibilities of the Social and Ethics Committee. As such, emphasis was placed on the Committee's oversight responsibility on ensuring that the entity is a good corporate citizen in terms of promotion of equality, observation of human rights and compliance with labour legislation and regulations.

The Committee provided oversight, as mandated by the Board, on the following aspects:

3.13 Strategies, Frameworks and Policies

- Revision of the Recruitment Policy
- Revision of the Overtime, Standby and Shift Policy
- Revision of the Performance Incentive Policy
- Addendum to the Remuneration Policy
- Ongoing Review of the Human Capital Management Delegation of Authority

3.14 Performance Monitoring

- Occupational Health and Safety Monitoring
- Employment Equity
- Skills Development
- Human Capital Management
- Skills audit on key departments

The membership of the Committee during the reporting period is reflected below and 4 meetings were convened for the execution of its responsibilities as follows:

Table 17: Meetings of the Human Resources and Remuneration Committee.

MEMBER	12/04/19	10/07/19	15/10/19	20/01/20
Ms Feziwe Renqe (Chairperson)	✓	✓	✓	✓
Ms Shirley Moroka-Mosia	✓	✓	✓	✓
Ms Sally Mudly - Padayachie	✓	✓	✓	✓

3.15 Strategic Programmes Committee

The Committee is accountable to the Board for the discharge of its responsibilities which include the following:

a. Fulfilling all its responsibilities related to governance and strategic leadership matters within its scope;
b. Assisting the Board in discharging its duties by ensuring that appropriate research, scientific and commercial programmes are undertaken by SAWS;
c. Reviewing strategies/business plans related to key scientific and technical programmes, including, but not limited to:
    i. Public good and commercial initiatives, including research;
    ii. Air quality and climate change; and
    iii. Any other strategic programmes and projects as may be identified from time to time.
d. Reviewing and monitoring the implementation of the Infrastructure Recapitalisation Programme;
e. Providing input on SAWS Strategic Plan, Annual Performance Plan and budget processes; and making approval recommendations to the Board, including approval in terms of the utilisation of capital budget;
f. Considering and making recommendations to the Board on any capital projects or procurement of any capital items that fall within its scope;
g. Monitoring the implementation of the Total Quality Management System;
h. Monitoring the implementation of the Annual Performance Plans and other Frameworks that fall within its scope;
i. Encouraging SAWS to invest in operations that protect and enhance the well-being of the economy, society and the natural environment within which it operates, in line with the environment related Principles of the United Nations Global Compact and including the development and implementation of environmentally friendly technologies;

j. Assisting the Board in its oversight of environmental sustainability aspects of the integrated reporting;
k. Overseeing the implementation of any key strategic programme(s) within the scope of the Committee; and
l. Performing any other activities as may be requested by the Board from time to time.

During the year under review and in compliance with best practice corporate governance, the Committee reviewed its terms of reference. In its review, the Committee considered the request made by the Shareholder that each entity reporting to the Department of Environment, Forestry and Fisheries (DEFF) should incorporate in its structures, the Social and Ethics Committee (SET). The Board took a view that its various Committees should incorporate the responsibilities of the SET that are relevant to their various mandates.

Key to the oversight exercised by the Committee on behalf of the Board during the 2019/20 financial year was the following:

3.16 Key Strategic Projects

- The launch of the Atmospheric Meteorological Terminology Book
- Launch of the YouTube Channel
- Relocation of radars for optimal performance

3.17 Compliance Requirements

- Monitoring of quarterly performance against the 2019/20 Annual Performance Plan (APP)
- Mid-year review of the 2019/20 APP
- Recommendation of the 2020/21 APP to the Board
- Tariff Review

3.18 Strategies, Frameworks and Policies

- Communication Strategy
- Information Communications and Technology (ICT) Strategy
- Sponsorship Policy

3.19 Performance Monitoring

- Review of the capital expenditure budget
- Infrastructure Performance (e.g. availability of the radars, lightning detection network etc.)
- Automatic Weather and Rain Stations
- Research & Development Strategy
- Integrated Service Strategy
- South African Air Quality Information System (SAAQIS). SAWS is the custodian of the system and is responsible for hosting, operation and maintenance thereof to ensure access to air quality, including providing support to the Mpumalanga Provincial Government in this regard
- Marine Master Plan
- Infrastructure and Information Systems projects
- Commercial Activities

Below is the membership and meetings held by the Committee during the reporting period:

Table 18: Meetings of the Strategic Programmes Committee.

	11/04/19	16/07/19	16/10/19	16/01/20
Mr David Lefutso (Chairperson)[9]	✓	✓	✓	✓
Dr Mphekgo Maila (Chairperson)[10]	✓	✓	✓	✓
Dr Tsakani Ngomane	-	✓	-	-

4. Remuneration of Board Members

Section 9 of the Act provides that any Member of the Board, other than the Chief Executive Officer and the Senior Official of the Department designated by the Director-General with the approval of the Minister to serve on the SAWS Board, must be paid such remuneration and allowances as the Minister, with the concurrence of the Minister of Finance, may determine.

The Director-General of National Treasury annually publishes a Notice of Adjustment of the remuneration levels and service benefit packages for office bearers in certain statutory and other institutions. This Notice is also applicable to SAWS as a Schedule 3A public entity. The SAWS is classified further for that purpose as a Category A Sub-category A1 entity.

9. **Ceased being the Chairperson on 31 October 2019**
10. **Was appointed as the Chairperson with effect from 1 November 2019**

The meeting attendance fees are shown below:

Table 19: Board Committee Meetings Attendance Fees.

CATEGORY A	MEETING FEE PER DAY	MEETING FEE PER HOUR
Sub-category A1		
Chairperson	R 5 230	R 654
Vice-Chairperson	R 4 445	R 556
Member	R 3 888	R 486

The Schedule indicating remuneration paid to each Board Member can be found on page 165 to 166 of the Annual Financial Statements.

5. Risk Management

In compliance with the requirements of the PFMA (No. 1 of 1999) Section 51.1 (a)(i) SAWS has an approved risk management policy which outlines the entity's commitment to managing risks events which might impact on the achievement of its objectives. Furthermore, embedded in the risk management policy is the risk management philosophy and approach which details SAWS' plan of action on how to effectively implement the risk management policy in day to day activities.

In executing the risk management policy, an annual risk assessment was conducted and the risk register was compiled and approved accordingly. Further, the risk response strategies to further mitigate the risks which are rated higher than the set risk tolerance and risk appetite were documented and monitored regularly to ensure that risk owners were effectively managing them.

The risk management reports were tabled at the Risk and Audit Committee which is chaired by a non-executive Board member. The Committee met on a quarterly basis as scheduled.

To promote a zero-tolerance environment to fraudulent and corrupt activities SAWS has put in place a whistleblowing policy and fraud and ethics hotline that is facilitated by an independent service provider. All the reported cases were communicated to the outsourced internal audit function (SizweNtsalubaGobodo-Grant Thornton), which tabled the reports to the Audit and Risk committee. In addition, SAWS has an approved fraud prevention policy and response plan.

6. Internal Audit Control

During the period under review, SAWS conducted an outsourced internal audit. The Internal Control Unit utilises a co-sourcing strategy to ensure that skills and competencies are available for the internal auditing of complex areas. The section is headed by a Chief Audit Executive from SizweNtsalubaGobodo-Grant Thornton who is accountable to the SAWS CEO and the Board through the SAWS Audit and Risk Committee (ARC). This reporting ensures the effectiveness of the internal audit by guaranteeing that its work is done objectively and independently.

The audit is governed by the PFMA, Treasury regulations, the King Report and the Standards for the Professional Practice of Internal Auditing.

The purpose of the internal audit is to provide an independent, objective assurance and consulting service that is designed to add value and improve the organisation's operations. The activity will help SAWS accomplish its objectives by bringing a systematic, disciplined approach to evaluating and improving the effectiveness of governance, risk management and control processes.

The internal audit activities are detailed in the annual Internal Audit Plan that was approved by the Audit and Risk Committee. They include:

- Considering the scope of work of the external auditors to ensure optimal audit coverage;
- Assessing the adequacy and effectiveness of internal control and risk management systems;
- Analysing and evaluating business processes and associated controls;
- Evaluating the effectiveness of controls over the reliability and integrity of management information;
- Ascertaining the level of compliance with relevant policies, plans, procedures, laws and regulations; and
- Recommending appropriate corrective actions.

All audit issues identified are reported to the Board Audit and Risk Committee and are tracked until resolved by Management.

6.1 Summary of audit work done

The following audit reviews were conducted in the period under review:

- Supply Chain Management Review;
- Remuneration and Payroll Review;
- Risk Management Review;
- Audit of Performance Information;
- Follow-up audits; and
- Two Ad hoc audits (Whistleblower Desktop Review and Submission of Audit Evidence to the AG).

Human Capital Management

PART D

1. Raising the bar on Talent Management and building key capabilities

1.1. Key Leadership Pipeline

The South African Weather Service (SAWS) continued to create a leadership-and innovation-driven environment to support the implementation of its mandate based on the constant need to adopt best practice talent management strategies.

The focus of the SAWS management development programme is on building leadership competencies in line with the organisation's strategic goals. The competencies this year included, amongst others, Private Public Partnerships, Governance Non-compliance, Risk Management, Monitoring and Evaluation, and Contract Management. In order to facilitate procurement processes, sixteen managers were especially trained in tender procurement, namely the Three Bid Committee Course.

The Regional Training Centre (RTC) team represented SAWS internationally, firstly as a member of the Executive Committee for Education and Training for the World Meteorological Organization (WMO) and secondly as a core member of the Expert Team for Education, Training and Competencies for Education and Training (ET).

The review of the recommended qualifications, called the Basic Instruction Packages for the Meteorologists and Meteorological Technicians, continued. The organisation was represented on the teams through the RTC with two members, one as a co-chair and another as team leader for the Meteorological Technician review. An updated qualification recommended for the Meteorological Technicians was sent out to other RTC directors for comment.

The RTC was reviewed by the WMO in September 2018. The final report with the re-confirmation was formally presented to the SAWS acting CEO in 2019 and will formally be reconfirmed.

1.2. Retention of Scarce and Critical Skills

The organisation remained committed to the development and implementation of key retention strategies to ensure talent growth and the availability of strategy-driven human capital.

1.3. Salary Parity

The organisation embarked on a salary parity exercise aimed at ensuring that employees are paid within a managed pay scale that is competitive within the labour market and implemented fairly and consistently for all employees.

The exercise was approved in the 2017/18 financial year, with implementation taking place in three phases. Phase 1 took place in 2017/18, phase 2 resumed during 2018/19 and was concluded in 2019/20, while the final phase of the project was earmarked to start during 2020/21. Due to financial constraints associated with COVID-19 towards the end of the reporting period, phase 3 had to be postponed.

This exercise was as a result of a considerable salary gap between employees within the organisation due to, among other things, historical factors pre-dating SAWS' agentisation, limited annual salary progression (excluding annual inflationary adjustments) and significant differences between SAWS pay scales and the market in the remuneration of certain positions, especially in the core competencies. Approximately 100 employees have thus far benefitted from this exercise in core areas such as Meteorological Technicians, Air Quality Technicians, Forecasters and Scientists.

The SAWS will, in the coming years, embark on collaboration efforts with other entities within the Department of Environment, Forestry and Fisheries (DEFF) on remuneration and benefits survey and benchmarking. This is in an attempt to ensure our employees are paid within the market trends.

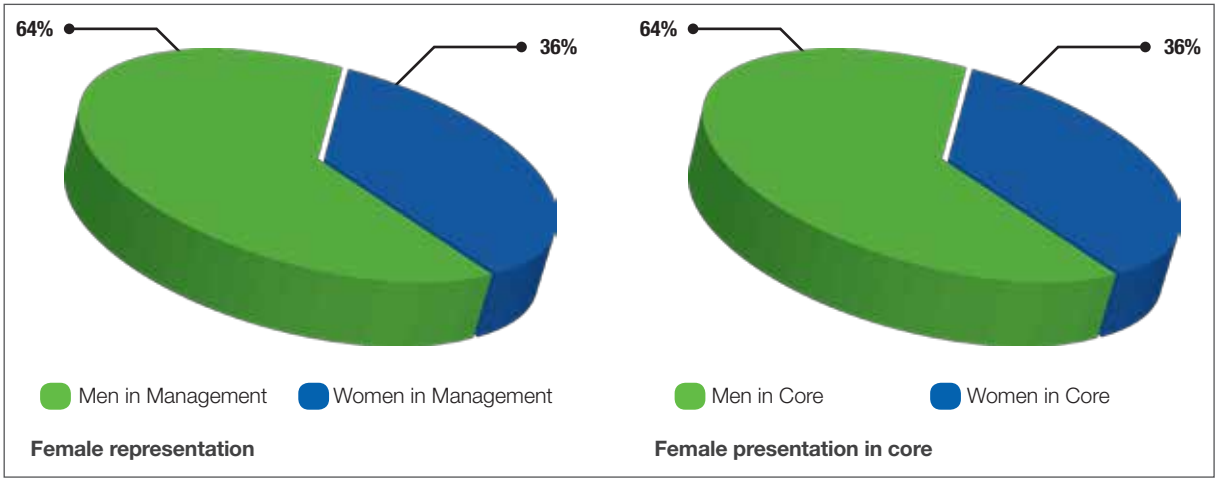
1.4. Employment Equity

The primary focus for SAWS is to approach diversity more broadly, with placement of women in management roles. This forms part of the broader organisational strategy to cultivate diversity in all dimensions as well as to reflect over time the demographics of the country in which the SAWS operates by attracting, selecting, developing and retaining people from Previously Disadvantaged Groups, with specific focus on placement of Africans. We are closely monitoring our progress in reaching our targets by 2022 as per our revised Employment Equity Plan.

The SAWS has submitted its annual EE Report using the online submissions. As with any legislation,

embracing the spirit of the legislation is key to ensuring successful implementation that makes business sense. The appointment of women in key positions is the priority of the organisation, notwithstanding budget constraints. Succession planning, management development, women acceleration programmes and development of women for managerial positions within the organisation remain our key drivers in bridging the gap.

The representation of women in management, as shown in the pie chart below (left), is at 36% and women in core areas (right) is also at 36%.



Graph 9: Female presentation in SAWS Core services.

Table 20: Employment equity.

OCCUPATIONAL LEVELS	GENDER								TOTAL		
	MALE				FEMALE				FOREIGN NATIONALS		
	A	C	I	W	A	C	I	W	MALE	FEMALE	
Top management	2				1						3
Senior management	6		1		4		1	2			14
Middle management	45	4	1	25	30	1		9	5	1	121
Junior management	79	6	4	22	68	8	3	14	1		205
Semi-skilled	45	8		7	47			4	1		119
Unskilled	16	5			5						26
Total	**193**	**23**	**6**	**54**	**155**	**16**	**4**	**29**	**7**	**1**	**488**
Temporary employees	19				15	1		1			36
Grand Total	**212**	**23**	**6**	**54**	**170**	**17**	**4**	**30**	**7**	**1**	**524**

Table 21: Comparison of SAWS and national demographic profiles.

RACE	NATIONAL DEMOGRAPHICS	BASELINE AS AT 31/03/2017	SAWS TARGET AS AT 31/03/2019	SAWS PERFORMANCE	DEVIATION FROM TARGETS
Africans	80.5%	67%	74%	72,5%	-2%
Whites	8.3%	20.19%	14.70%	16%	1%
Coloureds	8.8%	8.45%	8.80%	7,6%	-1%
Indians	2.5%	2.35%	2.50%	2%	-1%
Foreigners	0%	2.11%	0%	2%	2%
Total	**100%**	**100%**	**100%**	**100%**	
PWD	2%	2%	3%	2%	-1%

Graduated forecasters and their lecturers (from left to right): Mark Fourie, Jannie Stander, Bafana Mzimkhulu, Christina Liesker, Lee-ann Simpson, Samke Thwala, Stephanie Hinze, Xolani Matlou, Siyabonga Mpati and Ayabonga Tshungwana.

Graduated Meteorological Technicians and their lecturers (from left to right): Tinashe Gukushu, Thabiso Msiza, Nontobeko Langa Thembisa Gudwana, Bonolo Ngakaditsile, Colleen Rae, Shine Mkatshwa, Teke Ramotubei, Tshepo Naledi.

Fruitful engagements with numerous stakeholders resulted in further international collaborations which contributed to SAWS' global exposure and positioning. During the year under review, the annual Eumetsat Satellite Applications Course (E-SAC) took place during the last week of November and included participants from Ghana, South Sudan and many of the Indian Ocean Island States. Through the Newton Fund, other training initiatives were also acted on and the insurance industry was engaged to gauge their training requirements.

University engagements included talks with the Universities of the Witwatersrand, Venda, North West, Pretoria, the Tshwane University of Technological and the Council of Higher Education (CHE) around the alignment of related courses to international standards.

The new SAWS Board for 2019 was given an insight into meteorology on 29 July with a basic course in meteorology. The course focused on data and basic meteorology. Two English-speaking trainers from Niger (EAMAC) spent the two weeks at the RTC to focus on meteorological technician training. Methods of knowledge transfer were interrogated, time was spent with the three forecasting specialties and further collaboration in respect of future research projects were agreed upon. It was agreed that the two training centers would collaborate on research projects between the two student groups from both countries next year.

Commercial training was given to Lesotho meteorological technicians. The course consisted of four weeks on-line activities and two weeks face-to-face training in October and November 2019.

Commercial training was also given to Lesotho forecasters (four weeks on-line activities during October and two weeks face-to-face during November) as well as Namibian forecasters (three months on-line activities and then four weeks face-to-face in March) in aviation meteorological forecaster competencies. The face-to-face Namibian training was cut short due to the COVID-19 lockdown, but will continue later.

Lesotho personnel (forecasters and meteorological technicians) and their trainers.

The ASMET 12 project was launched during September 2019, at a working group meeting in Darmstadt, Germany. The ASMET 12 project is a collaboration between EUMETSAT, COMET and SAWS, where an online learning module will be created, which focusses on impact-based forecasting in South Africa.

A digital preservation working group was created that addressed preserving all SAWS publications and data. It is envisaged that a partner will be sought to digitize the open access information of SAWS.

2. Embedding a Safety Culture

The health and safety of the SAWS employees and its stakeholders remained a priority. In the year under review the world faced one of the biggest challenges in the form of the COVID-19 virus. The organisation had to put measures in place, in a bid to contribute to the Government's plans to stop the spread of the virus. It acted swiftly in implementing these measures, which included, amongst others, ensuring employees who were identified as a risk were put in isolation; suspending all major meetings/ conferences that were planned to take place in March 2020; minimised external visits; purchasing personal protective equipment for the employees; non-essential employees working from home; etc. We believe that the organisation's swift response has played a significant role in minimizing the spread of the virus amongst the SAWS employees and its stakeholders.

Safety awareness programmes were conducted throughout the year, with the Central Occupational Health and Safety Committee meeting three times during the year to review the safety issues affecting the organisation and its employees, and coming up with effective measures to address these issues. The issues that were identified during the Hazards Identification and Risk Assessment (HIRA), which was conducted in the previous year at some of the major SAWS offices, are being addressed on a continuous basis. During the year under review, the Board also took a decision to have issues surrounding the health and safety of SAWS employees reported to the board's Human Resource and Remuneration Committee (HRRC) on a quarterly basis. This was aimed at ensuring that the HRRC, as the committee charged with the responsibility of looking at issues affecting the employees, is made aware of all issues/incidents involving the employees, as well as to ensure that the SAWS complies with the applicable occupational health and safety prescripts.

2.1 Incidents

The table below depicts the incidents that took place during the 2019/20 financial year. All the incidents were attended to in line with the requirements of the Occupational Health and Safety prescripts, SAWS policy and procedures.

Table 22: Incidents during 2019/20 financial year.

Fatalities	0
Major incidents	5
Minor incidents	8
Near-miss incidents	None reported
Environmental incidents	None reported
Total	**13**

The SAWS also partnered with the Centre for Occupational and Wellness Services (Health1st) as part of its ongoing Employee Wellness Programme and Assistance Programme. This partnership enabled employees and their immediate family members to access a variety of holistic Employee Wellness benefits and services. Some of the benefits our employees across the country can now access include services such as:

- Telephonic assessment, counselling and referral 24 hours a day;
- Face to face counselling and advisory services through a national network of professionals, including psychologists, social workers, counsellors, etc.;
- Life Management services, including legal and financial telephonic guidance and family health-care advisory services; and
- Health and Wellness related information sessions.

Our aim as an organisation through this programme is to assist employees to prevent problems, challenges and concerns from building up, which may negatively impact their wellbeing, by dealing with issues early and effectively.

One of the key benefits of this partnership was realised during the early stages of the COVID-19 outbreak where guidance and information was provided which helped in our communication to all employees, especially those considered at risk, and in providing emotional support during precautionary self-isolation and lockdown.

2.2 Wellness and Financial day

The SAWS hosted its annual employee wellness day at all its offices across the country in partnership with a few external stakeholders.

Several medical aid schemes supported their members by providing blood tests, glucose and HIV/Aids tests and other essential services to check and verify their health.

Staff were treated to relaxing treatments on Wellness Day 2019.

3. Culture and Change Management

3.1 Policies and Procedures

The SAWS seeks to activate and reinvigorate a winning mentality and drive for innovation, to ensure accountability and to inculcate customer-centric behaviour, agility, collaboration and trust throughout the organisation.

The organisation recognises that relevant and up-to-date policies and procedures as governing tools can help drive a positive organisational culture. HCM therefore invested time and resources to review a total of six policies and framework documents during the year in review. These policies will drive culture change in the organisation. This process involved robust engagements with various stakeholders including Organised Labour to ensure cross-functional collaboration and employee participation in compliance and governance activities.

3.2 Employee Engagements through Human Capital Management (HCM) and Leadership Visibility

HCM roadshows were conducted during this financial year across SAWS regional offices, affording employees an opportunity to engage directly with HCM leadership and business partners and obtain quick and direct responses to people-related queries on matters such as the salary parity exercise, performance management, employee wellbeing, and career growth at SAWS. These involved robust, open and honest engagements, where employees' issues were raised and inputs provided into various functions of the organisation. The feedback report derived from these roadshows resulted in fast-tracking and improving on leadership communication across the organisation. Thus about eight further EXCO roadshows were conducted across all SAWS offices to promote employee dialogue, organisational leadership visibility and to use these as a tool of providing employees with organisational performance beyond written/published communication.

3.3 Building an Effective Organisation through Organisational Design

To ensure sustainability and maintain SAWS' competitive edge, it is imperative that the organisation is supported by technologically advanced infrastructure; efficient processes and systems; competent human capital with the right set of skills, attitude and behaviour; and a supportive organisational structure.

During this financial year, the SAWS therefore evaluated in excess of 60 jobs following organisational changes in 2017/18. A Job Evaluation Committee was appointed which is diversely representative of various functions, levels and individuals within SAWS, including organised Labour representatives. The Job Evaluation process is very critical in any organisation, as it determines the relative worth of a job and allows the employer to analyse jobs in terms of both salary and organisational fit. The Job Evaluation process ensures that an organisation remunerates a job level fairly in relation to both internal and external benchmarks, and it is helpful for outlining compensation plans. Therefore this Committee's responsibility is, amongst others, to:

- Review or moderate the evaluations carried out by a Job Analyst;
- Ensure that a job has been analysed thoroughly and consistently relative to other jobs previously evaluated;
- Make recommendations on any job evaluation policy amendments; and
- Address and resolve appeals and disputes related to job evaluations.

All the appointed members of the committee attended training in order to capacitate them in understanding their role as well as to gain foundation knowledge on theories and principles of Job Evaluation.

4. Recognition Programmes

4.1. Employee Excellence and Long Service Awards

As part of SAWS' winning formula, the organisation takes pride in its people and continually recognises and rewards internal role models with performance excellence awards. In addition to this, SAWS salutes and applauds employees with years of dedicated service to the organisation and encourages a culture of high innovation and performance through its annual Employee and Recognition Awards event. The purpose of the event is to honour and recognise employees who have achieved significant milestones in the organisation and help uphold organisational values in various ways. It is designed to foster scientific innovation, performance, collaboration and accountability. The event was held in December 2019.

This year, various employees walked away with a number of awards across eight different awards categories. The event saw two employees stand out as top performers, when each of them walked away with two awards. The one employee received the Scientist of the Year Award, as well as the Emerging Talent Award, while the other received the Innovation Award and Employee of the Year award.

Winner of Scientist of the Year Award and Emerging Talent Award: Mr Brighton Mabasa.

Winner of Employee of the Award and Innovation Award: Mr Quinton Jacobs.

Fifty four Long Service awards, (10, 15, 25, 30, 35 years and above), were also presented during the event, with over half being received by employees who have served 10 years in the organisation, while three candidates with 40 years or more, received special long service recognition awards.

Celebrating successes together is an important way in which individuals are motivated and rewarded for their contribution to the business, and these awards are a fitting way to acknowledge and honour achievements without which the organisation's strategic goals and sustainability cannot be assured.

Some of the 54 Long Service awards

Ms Nomvuso Bosizi received a 10-year long service award.

Ms Robin Lee Batties received a 10-year long service award.

Mr Lucky Ntsangwane received a 15-year long service award.

Ms Pinkie Nlomo received a 25-year long service award.

Mr Andrew van der Merwe received a 30-year long service award.

Mr Kaizer Mangwane received a 35-year long service award.

Mr Tonie Rossouw received a special award for 40 years' service.

5. Disciplinary Processes

The SAWS strives to create a stable and harmonious working environment. In order to attain this objective, a number of initiatives were identified and some were embarked upon. The desired outcome is to foster good relations between employees and management that will leverage a rapport which will, in turn, position SAWS to become an Employer of Choice. The organisation's ultimate goal is to have a professional, engaged and flexible workforce, operating successfully in a positive environment.

Three cases of employee misconduct were reported during the period under review. Two of the employees were suspended, disciplinary hearings were conducted and two final written warnings were issued, while the other case of misconduct is still being investigated. Two grievances were reported and a mediator was appointed but, due to the global outbreak of the COVID-19 virus, these will be concluded in the next financial year. Three CCMA cases were referred by former employees, two of these have been finalised, while the arbitration proceedings are still on-going for the other case.

Financial Information

PART E

97	Audit and Risk Committee Report
99	Report of the Auditor-General to Parliament on the South African Weather Service
104	Statement of Financial Position
105	Statement of Financial Performance
106	Statement of Changes in Net Assets
107	Cash Flow Statement
108	Statement of Comparison of Budget and actual Amounts
111	Accounting Policies
138	Notes to the Annual Financial Statements

AUDIT AND RISK COMMITTEE REPORT

The Audit and Risk Committee (the Committee) is pleased to present its annual report for the financial year ending 31 March 2020.

The Committee complied with its responsibilities arising from Section 77 of the Public Finance Management Act, 1999 (Act No. 1 of 1999 as amended) (PFMA), Treasury Regulation 27.1 and its reviewed and adopted Charter that regulates the Committee's mandate and the execution thereof.

1. Audit and Risk Committee Membership and Attendance of Meetings

The Committee is constituted as a statutory committee and has an independent role with accountability to the board. The composition of the Committee and the attendance of meetings during the period under review are listed under the Governance Section of the Annual Report, page 79 to 86.

2. Committee's Responsibilities

TThe main responsibilities of the Committee, as outlined in the Committee's Charter include, but are not limited to:

- Review of the financial management processes and the adequacy of internal controls;
- Review of the Annual Financial Statements, the Annual Report and related regulatory filings before these are released, in order to consider the validity, accuracy and completeness of the information;
- Governance of risk and Information Communication Technology (ICT);
- Overseeing the internal and external audit functions and related audit processes;
- Review of SAWS' compliance with the performance management and reporting systems;
- Review of the risk profile and management action plans at the SAWS to address the identified risks; adequacy of adopted risk responses; progress made; and
- Ensuring that all the disclosures and/or reporting requirements to the Board, the Shareholder, the National Treasury and the Auditor-General are adhered to.

3. The Effectiveness of Internal Controls

The implementation of effective and efficient internal controls and procedures is an ongoing process. During the year under review the Committee guided the Internal Audit function in the preparation and implementation of the Annual Audit Plan and ensured that the Internal Audit Plan was risk-based, taking the risk profile of the SAWS into consideration.

The Committee reviewed the reports from both internal and external auditors and based on these reviews, it considers the systems of internal control for the period under review to be partially effective. Where weaknesses were identified, corrective measures were proposed for implementation.

The audit findings issued by the Auditor-General (AG) from the 2018/19 audits were to the extent possible addressed by SAWS; and some findings were either partially resolved or not resolved. The Committee has implemented a dashboard that is presented at all Committee meetings to track progress on resolution of findings.

4. The quality of in-year management and quarterly reports submitted in terms of the PFMA

The Committee was satisfied with the content and quality of quarterly reports prepared and issued by SAWS during the year under review. Furthermore, the Committee reviewed the actual performance of SAWS against the strategic objectives and targets set in the Annual Performance Plan for 2019/20. Where required, the Committee made recommendations for enhancement of the reports.

5. Evaluation of the Annual Financial Statements and Annual Report

The Audit and Risk Committee has:

- Reviewed and discussed the audited financial statements to be included in the Annual Report, with the Auditor-General and the Accounting Authority;
- Reviewed the Auditor-General of South Africa's management report and management's comments thereto;

- Reviewed the SAWS's compliance with legal and regulatory provisions;
- Reviewed significant adjustments resulting from the audit; and
- Reviewed the information on predetermined objectives to be included in the annual report.

6. Summary of Main Activities undertaken by the Committee during the Financial Year under Review

The Committee attended to the following matters:

- The quarterly review of performance (financial and non-financial) against the 2019/20 budget and the Annual Performance Plan (APP);
- Review of the annual budget for the 2020/21 financial year for the Board's consideration and approval;
- A review of the Annual Financial Statements for the year ended 31 March 2020;
- Monitoring the implementation of the Risk Management, Information Communication Technology Governance and Legal and Compliance activities, with reports on these considered as standing items at all Committee meetings; and
- Keeping the Board informed of key issues within the Committee's scope, and Committee Reports were submitted and presented at all Board meetings.

7. Internal Audit

At the end of the 2019/20 financial year, the Internal Auditors reported that they had executed all the activities expected of them in terms of the Internal Audit Plan for the reporting period and concluded that the system of internal control is only partly adequate and/or effective as it can only be partly relied upon to provide assurance that business objectives will be met within SAWS's control environment. The Internal Auditors made recommendations in relation to the weaknesses identified and it is anticipated that tightening of controls will significantly improve the internal control environment.

8. Auditor-General of South Africa

The Committee ensured that the Auditor General of South Africa is presented with financial statements that are fairly presented and prepared in accordance with the standards of Generally Recognised Accounting Practice (GRAP) as required by section 55(1)(b) of the Public Finance Management Act. The Committee met representatives from the Auditor General of South Africa throughout the audit of the SAWS 2019/20 annual financial statements and exercised its oversight role on the overall audit process.

9. Other Audits

During the current year under review, allegations of fraud, corruption and mismanagement were reported to the Accounting Authority. These allegations were investigated internally with the Audit and Risk Committee exercising its mandated oversight role. As at the end of the reporting period, this investigation was still underway.

Mr Itani Phaduli
Chairperson of the Audit and Risk Committee
13 October 2020

REPORT OF THE AUDITOR-GENERAL TO PARLIAMENT ON THE SOUTH AFRICAN WEATHER SERVICE

Report on the audit of the financial statements

Opinion

1. I have audited the financial statements of the South African Weather Service set out on pages 104 to 174, which comprise the statement of financial position as at 31 March 2020, statement of financial performance, statement of changes in net assets, and cash flow statement and statement of comparison of budget and actual amounts for the year then ended, as well as the notes to the financial statements, including a summary of significant accounting policies.

2. In my opinion, the financial statements present fairly, in all material respects, the financial position of the South African Weather Service as at 31 March 2020, and its financial performance and cash flows for the year then ended, in accordance with South African Standards of Generally Recognised Accounting Practice (SA Standards of Grap) and the requirements of the requirements of the Public Finance Management Act of South Africa, 1999 (Act No.1 of 1999) (PFMA).

Basis for opinion

3. I conducted my audit in accordance with the International Standards on Auditing (ISAs). My responsibilities under those standards are further described in the auditor-general's responsibilities for the audit of the financial statements section of this auditor's report.

4. I am independent of the public entity in accordance with sections 290 and 291 of the *Code of ethics for professional accountants* and parts 1 and 3 of the *International Code of Ethics for Professional Accountants (including International Independence Standards)* of the International Ethics Standards Board for Accountants (IESBA codes), as well as the ethical requirements that are relevant to my audit in South Africa. I have fulfilled my other ethical responsibilities in accordance with these requirements and the IESBA codes.

5. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Emphasis of matters

6. I draw attention to the matters below. My opinion is not modified in respect of these matters.

Material impairment – statutory receivables

7. As disclosed in note 6 to the financial statements, material impairments of R 17 128 573 were made as a result of provision for irrecoverable statutory receivables.

Significant subsequent event

8. I draw attention to note 39 in the financial statements, which deals with subsequent events and specifically the possible effects of the future implications of Covid-19 on the public entity's future prospects, performance and cash flows. Management have also described how they plan to deal with these events and circumstances.

Responsibilities of the accounting authority for the financial statements

9. The board of directors, which constitute the accounting authority is responsible for the preparation and fair presentation of the financial statements in accordance with SA Standards of Grap and the PFMA, and for such internal control as the accounting authority determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

10. In preparing the financial statements, the accounting authority is responsible for assessing the public entity's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting unless the appropriate governance structure either intends to liquidate the public entity or to cease operations, or has no realistic alternative but to do so.

Auditor-general's responsibilities for the audit of the financial statements

11. My objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with the ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

12. A further description of my responsibilities for the audit of the financial statements is included in the annexure to this auditor's report.

Report on the audit of the annual performance report

Introduction and scope

13. In accordance with the Public Audit Act of South Africa, 2004 (Act No. 25 of 2004) (PAA) and the general notice issued in terms thereof, I have a responsibility to report on the usefulness and reliability of the reported performance information against predetermined objectives for selected objectives presented in the annual performance report. I performed procedures to identify material findings but not to gather evidence to express assurance.

14. My procedures address the usefulness and reliability of the reported performance information, which must be based on the approved performance planning documents of the public entity. I have not evaluated the completeness and appropriateness of the performance indicators included in the planning documents. My procedures do not examine whether the actions taken by the public entity enabled service delivery. My procedures also do not extend to any disclosures or assertions relating to planned performance strategies and information in respect of future periods that may be included as part of the reported performance information. Accordingly, my findings do not extend to these matters.

15. I evaluated the usefulness and reliability of the reported performance information in accordance with the criteria developed from the performance management and reporting framework, as defined in the general notice, for the following selected objectives presented in the annual performance report of the public entity for the year ended 31 March 2020:

OBJECTIVES	PAGES IN THE ANNUAL PERFORMANCE REPORT
Strategic objective 1.1: warnings, alerts and advisories	73

16. I performed procedures to determine whether the reported performance information was properly presented and whether performance was consistent with the approved performance planning documents. I performed further procedures to determine whether the indicators and related targets were measurable and relevant, and assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.

17. The material findings in respect of the usefulness of the selected objective are as follows:

Strategic objective 1.1: warnings, alerts and advisories

Percentage of national weather (FPZA41) available

18. The method of calculation for achieving the planned indicator was not clearly defined as the technical indicator description does not specifically indicate that the weather forecast bulletins sent out are only considered as an achievement when they are sent out by the predetermined time, which affects the measurement of the performance achievement.

Percentage availability of marine (SOLAS)

19. The method of calculation for achieving the planned indicator was not clearly defined as the technical indicator description does not specifically indicate that the weather forecast bulletins sent out are only considered as an achievement when they are sent out by the predetermined time, which affects the measurement of the performance achievement.

Other matter

20. I draw attention to the matter below.

Achievement of planned targets

21. Refer to the annual performance report on pages 73 to 77 for information on the achievement of planned targets for the year and explanations provided for the overachievement of a number of targets. This information should be considered in the context of the material findings on the usefulness of the reported performance information in paragraphs 18 and 19 of this report.

Report on the audit of compliance with legislation

Introduction and scope

22. In accordance with the PAA and the general notice issued in terms thereof, I have a responsibility to report material findings on the public entity's compliance with specific matters in key legislation. I performed procedures to identify findings but not to gather evidence to express assurance.

23. The material findings on compliance with specific matters in key legislation are as follows:

Annual financial statements, performance report and annual report

24. The financial statements submitted for auditing were not prepared in accordance with the prescribed financial reporting framework, as required by section 55(1)(b) of the PFMA.

25. Material misstatements of non-current assets, current assets, liabilities, expenditure and disclosure items identified by the auditors in the submitted financial statements were corrected, resulting in the financial statements receiving an unqualified audit opinion.

Expenditure management

26. Expenditure was incurred in excess of the approved budget, in contravention of section 53(4) of the PFMA.

27. Effective and appropriate steps were not taken to prevent irregular expenditure amounting to R45 914 522 as disclosed in note 37 to the annual financial statements, as required by section 51(1)(b)(ii) of the PFMA. The majority of the irregular expenditure was caused by the public entity's actual expenditure exceeding its budgeted expenditure, the procurement processes not being followed in the acquisition of office accommodation, and the renewal of the information technology (IT) infrastructure not following the required supply chain management process.

Consequence management

28. I was unable to obtain sufficient appropriate audit evidence that disciplinary steps were taken against officials who had incurred irregular, fruitless and wasteful expenditure, as required by section 51(1)(e)(iii) of the PFMA. This was due to proper and complete records not being maintained as evidence to support the investigations into irregular, fruitless and wasteful expenditure.

Other information

29. The accounting authority is responsible for the other information. The other information comprises the information included in the annual report, which includes the audit committee's report. The other information does not include the financial statements, the auditor's report and those selected objectives presented in the annual performance report that have been specifically reported in this auditor's report.

30. My opinion on the financial statements and findings on the reported performance information and compliance with legislation do not cover the other information and I do not express an audit opinion or any form of assurance conclusion thereon.

31. In connection with my audit, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements and the selected objectives presented in the annual performance report, or my knowledge obtained in the audit, or otherwise appears to be materially misstated.

32. If, based on the work I have performed, I conclude that there is a material misstatement in this other information, I am required to report that fact. I have nothing to report in this regard.

Internal control deficiencies

33. I considered internal control relevant to my audit of the financial statements, reported performance information and compliance with applicable legislation; however, my objective was not to express any form of assurance on it. The matters reported below are

limited to the significant internal control deficiencies that resulted in the basis for the findings on the annual performance report and the findings on compliance with legislation included in this report.

34. The financial statements provided for audit purposes were not prepared in accordance with the financial reporting framework as numerous audit findings were raised, many of which were material. Inadequate and insufficient management review controls were in place to ensure that the financial statements prepared were free from material misstatement.

35. The public entity developed a plan to address internal and external audit findings and was assigned to the appropriate level of management to monitored adherence to the plan. However, the monitoring was inadequate in reducing the number of significant findings raised on the financial statements, the annual performance report and compliance matters.

36. Inadequate and insufficient preventative compliance monitoring controls have been designed and implemented to avoid repeat instances of non-compliance with the PFMA.

37. Inadequate design and implementation of IT governance processes were noted and could result in breakdown in controls and oversight, as well as IT not being strategically aligned to business. IT controls pertaining to security management, program change management, IT service continuity, user access management, and physical and environmental controls were not effectively designed and implemented by the responsible management.

Other reports

38. I draw attention to the following engagements conducted by various parties which had, or could have, an impact on the matters reported in the public entity's financial statements, reported performance information, compliance with applicable legislation and other related matters. These reports did not form part of my opinion on the financial statements or my findings on the reported performance information or compliance with legislation.

39. A forensic investigation was conducted by an external service provider to investigate allegations of financial misconduct and fraud within the supply chain management processes as identified from a whistle-blower's report. As at financial year end, the investigation was not yet concluded.

40. An independent consultant investigated an allegation of possible misappropriation of the public entity's assets at the request of the public entity, which covered the period February 2017 to August 2018. The investigation was concluded on 11 April 2019 and resulted in criminal proceedings against two employees. These proceedings were in progress at the date of this auditor's report.

Auditor - General

Pretoria
30 September 2020

AUDITOR-GENERAL
SOUTH AFRICA

Auditing to build public confidence

ANNEXURE – AUDITOR-GENERAL'S RESPONSIBILITY FOR THE AUDIT

1. As part of an audit in accordance with the ISAs, I exercise professional judgement and maintain professional scepticism throughout my audit of the financial statements and the procedures performed on reported performance information for selected objectives and on the public entity's compliance with respect to the selected subject matters.

Financial statements

2. In addition to my responsibility for the audit of the financial statements as described in this auditor's report, I also:

    - identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error; design and perform audit procedures responsive to those risks; and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control

    - obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the public entity's internal control

    - evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the accounting authority

    - conclude on the appropriateness of the accounting authority's use of the going concern basis of accounting in the preparation of the financial statements. I also conclude, based on the audit evidence obtained, whether a material uncertainty exists relating to events or conditions that may cast significant doubt on the ability of the South African Weather Service to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements about the material uncertainty or, if such disclosures are inadequate, to modify my opinion on the financial statements. My conclusions are based on the information available to me at the date of this auditor's report. However, future events or conditions may cause a public entity to cease operating as a going concern

    - evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and determine whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

Communication with those charged with governance

3. I communicate with the accounting authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

4. I also confirm to the accounting authority that I have complied with relevant ethical requirements regarding independence, and communicate all relationships and other matters that may reasonably be thought to have a bearing on my independence and, where applicable, actions taken to eliminate threats or safeguards applied.

STATEMENT OF FINANCIAL POSITION

as at March 31, 2020

Figures in Rand	Note(s)	2020	2019 Restated*
Assets			
Current Assets			
Inventories	4	3,658,207	5,624,406
Receivables from exchange transactions	5	6,902,449	11,153,881
Statutory receivables	6	10,957,607	12,203,113
Prepayments	7	6,284,107	7,733,560
Cash and cash equivalents	8	44,535,907	60,691,221
		72,338,277	**97,406,181**
Non-Current Assets			
Investment property	9	71,779,121	69,277,188
Property, plant and equipment	10	320,685,853	319,513,018
Intangible assets	11	9,605,024	20,711,245
		402,069,998	409,501,451
Total Assets		**474,408,275**	**506,907,632**
Liabilities			
Current Liabilities			
Operating lease liability	12	1,336,230	2,759,322
Payables from exchange transactions	13	33,492,843	31,214,722
Employee benefit obligation	14	6,976,706	5,334,974
Unspent conditional grants and receipts	15	16,709,292	15,955,833
Provisions	16	-	8,058,746
Unspent government allocations – conditional grant CAPEX	17	54,166,428	27,516,777
		112,681,499	**90,840,374**
Non-Current Liabilities			
Employee benefit obligation	14	2,641,000	4,128,964
Provisions	16	362,913	489,234
		3,003,913	**4,618,198**
Total Liabilities		**115,685,412**	**95,458,572**
Net Assets		**358,722,863**	**411,449,060**
Reserves			
Revaluation reserve		51,040,050	57,050,448
Accumulated surplus		307,682,813	354,398,612
Total Net Assets		**358,722,863**	**411,449,060**

*** See Note 34**

STATEMENT OF FINANCIAL PERFORMANCE

Figures in Rand	Note(s)	2020	2019 RESTATED*
Revenue			
Revenue from exchange transactions			
Commercial revenue	18	164,167,517	160,608,681
Other revenue	18	1,197,969	1,229,755
Interest received - investment	19	3,714,215	4,592,966
Total revenue from exchange transactions		**169,079,701**	**166,431,402**
Revenue from non-exchange transactions			
Transfer revenue			
Government grants and subsidies	20	270,945,597	209,488,223
Public contributions and donations	21	4,790,479	6,844,361
Total revenue from non-exchange transactions		**275,736,076**	**216,332,584**
Total revenue		**444,815,777**	**382,763,986**
Expenditure			
Employee related costs	22	(277,548,027)	(261,335,504)
Administration	23	(9,572,132)	(11,558,015)
Depreciation and amortisation	24	(28,645,682)	(23,732,753)
Finance costs	25	-	(953,196)
Impairment of Receivables	26	(10,186,006)	(4,878,144)
Bad debts written off		(1,807,484)	-
General expenses	27	(154,600,817)	(142,758,677)
Total expenditure		**(482,360,148)**	**(445,216,289)**
Operating deficit		**(37,544,371)**	**(62,452,303)**
Loss on disposal of assets and liabilities		-	(10,173,331)
Loss on foreign exchange		(1,249,169)	(1,256,634)
Fair value adjustments	28	2,501,933	1,789,248
Actuarial gains/losses	14	1,607,964	1,330,000
Impairment loss	29	(12,040,488)	(519,953)
Inventories losses/write-downs	4	8,332	248,661
		(9,171,428)	**(8,582,009)**
Deficit for the year		**(46,715,799)**	**(71,034,312)**

*** See Note 34**

STATEMENT OF CHANGES IN NET ASSETS

Figures in Rand	Revaluation reserve	Accumulated surplus	Total net assets
Opening balance as previously reported	53,218,890	474,359,382	527,578,272
Adjustments			
Prior year adjustments (refer to note 34)	2,898,386	(48,926,458)	(46,028,072)
Balance at April 1, 2018 as restated*	**56,117,276**	**425,432,924**	**481,550,200**
Adjustment for prior year effect	(2,711,724)	-	(2,711,724)
Changes in net assets	-	-	-
Land - Garsfontein	2,722,132	-	2,722,132
Building - Irene and Bethlehem	922,764	-	922,764
Net income recognised directly in net assets	933,172	-	933,172
Deficit for the year	-	(71,034,312)	(71,034,312)
Total recognised income and expenses for the year	933,172	(71,034,312)	(70,101,140)
Total changes	933,172	(71,034,312)	(70,101,140)
Opening balance as previously reported	56,863,786	405,397,022	462,260,808
Adjustments			
Prior year adjustments	186,662	(50,998,411)	(50,811,749)
Balance at April 1, 2019 as restated*	**57,050,448**	**354,398,611**	**411,449,059**
Changes in net assets			
Revaluation of Land	(5,105,647)	-	(5,105,647)
Revaluation of Buildings	1,514,571	-	1,514,571
Impairment losses on revalued Aircraft Airframe	(726,887)	-	(726,887)
Impairment losses on revalued Aircraft Propeller	(7,088)	-	(7,088)
Impairment losses on revalued Aircraft Engine	(1,685,347)	-	(1,685,347)
Net losses recognised directly in net assets	(6,010,398)	-	(6,010,398)
Deficit for the year	-	(46,715,798)	(46,715,798)
Total recognised income and expenses for the year	(6,010,398)	(46,715,798)	(52,726,196)
Total changes	(6,010,398)	(46,715,798)	(52,726,196)
Balance at March 31, 2020	**51,040,050**	**307,682,813**	**358,722,863**

*** See Note 34**

CASH FLOW STATEMENT

Figures in Rand	Note(s)	2020	2019 Restated*
Cash flows from operating activities			
Receipts			
Commercial and other income		165,988,856	169,272,930
Grants and subsidies		297,589,000	209,488,222
Interest income		3,714,215	4,592,966
		467,292,071	383,354,118
Payments			
Employee costs		(277,038,420)	(268,687,765)
Suppliers		(196,296,453)	(153,918,811)
Finance costs		-	(953,196)
		(473,334,873)	(423,559,772)
Net cash flows from operating activities	30	**(6,042,802)**	**(40,205,654)**
Cash flows from investing activities			
Purchase of property, plant and equipment	10	(33,078,885)	(24,296,046)
Purchase of intangible assets	11	(3,683,278)	(2,950,473)
Net cash flows from investing activities		**(36,762,163)**	**(27,246,519)**
Cash flows from financing activities			
Movement in unspent government allocations – conditional grant		26,649,651	27,516,777
Net decrease in cash and cash equivalents		**(16,155,314)**	**(39,935,396)**
Cash and cash equivalents at the beginning of the year		60,691,221	100,626,617
Cash and cash equivalents at the end of the year	8	**44,535,907**	**60,691,221**

*** See Note 34**

STATEMENT OF COMPARISON OF BUDGET AND ACTUAL AMOUNTS

Budget on Accrual Basis						
Figures in Rand	**Approved budget**	**Adjustments**	**Final budget**	**Actual amounts on comparable basis**	**Difference between final budget and actual**	**Reference**
Statement of financial performance						
Revenue						
Revenue from exchange transactions						
Commercial Revenue	166,196,000	-	166,196,000	164,167,517	(2,028,483)	1.1
Other Revenue and Interest received - investment	7,500,000	-	7,500,000	4,912,184	(2,587,816)	1.3
Total revenue from exchange transactions	**173,696,000**	**-**	**173,696,000**	**169,079,701**	**(4,616,299)**	
Revenue from non-exchange transactions						
Transfer revenue						
Government grants	282,589,000	-	282,589,000	270,945,597	(11,643,403)	1.2
Contributions and donations	7,500,000	-	7,500,000	4,790,479	(2,709,521)	1.4
Total revenue from nonexchange transactions	**290,089,000**	**-**	**290,089,000**	**275,736,076**	**(14,352,924)**	
Total revenue	**463,785,000**	**-**	**463,785,000**	**444,815,777**	**(18,969,223)**	
Expenditure						
Employee cost	(267,792,000)	-	(267,792,000)	(277,548,027)	(9,756,027)	1.5
Administrative and operating costs	(161,137,000)	-	(161,137,000)	(164,172,949)	(3,035,949)	1.5
Depreciation and amortisation	(39,062,000)	-	(39,062,000)	(28,645,682)	10,416,318	1.6
Impairment of receivables	-	-	-	(10,186,006)	(10,186,006)	1.5
Bad debts written off	-	-	-	(1,807,484)	(1,807,484)	
Total expenditure	**(467,991,000)**	**-**	**(467,991,000)**	**(482,360,148)**	**(14,369,148)**	
Operating deficit	**(4,206,000)**	**-**	**(4,206,000)**	**(37,544,371)**	**(33,338,371)**	
Loss on foreign exchange	-	-	-	(1,249,169)	(1,249,169)	
Fair value adjustments	4,206,000	-	4,206,000	2,501,933	(1,704,067)	1.7
Actuarial gains/losses	-	-	-	1,607,964	1,607,964	1.7
Impairment loss	-	-	-	(12,040,488)	(12,040,488)	
Inventories losses/write-downs	-	-	-	8,332	8,332	
	4,206,000	**-**	**4,206,000**	**(9,171,428)**	**(13,377,428)**	
Deficit before taxation	**-**	**-**	**-**	**(46,715,799)**	**(46,715,799)**	
Actual amount on comparable presented in the budget and actual comparative statement	**-**	**-**	**-**	**(46,715,799)**	**(46,715,799)**	

STATEMENT OF COMPARISON OF BUDGET AND ACTUAL AMOUNTS

1. Budget differences

Material differences between budget and actual amounts

The budget is approved on accrual basis by nature classification. The approved budget covers the period 1 April 2019 to 31 March 2020.

The Annual Financial Statements are prepared using a classification on the nature of expenses in the Statement of Financial Performance.

1.1 Revenue from Exchange Transactions (Commercial Revenue)

Total Revenue from exchange transactions which is made up of Aviation (Regulated) Revenue, Non-Regulated Commercial Revenue and Other Revenue and Investment Income was below the target by R4,62m amounting to R169,08m against the budget of R174m.

The revenue from aviation which is mainly driven by air-traffic volumes saw a significant drop in the month of March where revenues received from the aviation sector amounted to R7,98m whereas the average revenue for the past eleven months was R11,02m. Even though the lockdown was announced towards the end of March 2020, the COVID-19 pandemic was already at its peak in Europe, the Middle East, Australasia and other foreign countries which had started with their own lockdown impacting on aviation travel.

The SAWS' Non-Regulated Commercial revenue, which is revenue generated from the sale of SAWS weather and meteorological products and services amounted to R36,25m, slightly above the target of R36,19m by R59k. This is despite some of the internal challenges that were faced in sourcing spare parts to support the Air Quality stream which is one of the larger contributors to Commercial revenue, SAWS was still able to meet its target.

The sale of instruments to customers and revenue from information fees offered through our commercial partners and especially new ventures into the hydrologic space boosted the Non-Regulated Commercial revenue stream.

1.2 Government Grants

During the current financial year, SAWS in addition to the normal operational Grant from Government, received a Capital Expenditure Grant of R53m and an Early Warning Grant of R40m as part of its allocation for the 2019/20 financial year.

Capital Expenditure and Early Warning Grant

The Capital Expenditure Grant and the Early Warning Grant allocation amounted to R93m as stated above.

During the current financial year an amount of R59,86m was recognised as revenue due to the conditions of the conditional grant being met. Of this total, an amount of R29,58m was utilised for capital expenditure funding while the remaining amount consisted of operational expenditure.

The unspent portion of the conditional grant as reflected on the Statement of Financial Position will only be recognised in revenue upon the fulfilment of the conditions attached thereto.

1.3 Investment Income

The total interest from investments for the year amounts to R3,71m below the target of R5m by R1,29m. This is mainly attributed to slow paying customers and as a result funds that were previously invested in fixed deposit accounts were recalled.

1.4 Contributions and Donations

During the year under review, SAWS realised project income to the value of R3,72m. Actual receipts for project income received during the year amounted to R4,47m, these were for various projects and the grants have been spent in accordance with the conditions attached to them.

1.5 Expenditure

The Total Expenditure for the year amounted to R485,95m which is R17,95m above the budget of R467,99m.

STATEMENT OF COMPARISON OF BUDGET AND ACTUAL AMOUNTS

1. Budget differences (continued)

The Administrative and Operating Expenditure for the period amounts to R164,17m which exceeded the budget of R161,14m by R3,04m.

The major areas of over-expenditure were mainly due to the following:

Included under Consumable spares are Cost of sales, which exceeded budget by R6,1m as a result of additional revenue from the sale of Instruments as well as the payments for the purchase of gases for all Air Quality stations.

Information and Communication costs, which are related to internet costs, telephone, data and lease data costs exceeded budget by R2,3m. These costs are based on usage, while monitoring to curb abuse will be improved in the future as part of the cost containment measures.

Repairs and Maintenance and Relocation Costs: The overspending amount of R2,5m relates to System support and infrastructure maintenance.

For System support, the number of potential logged calls in relation to the new ERP system that was implemented during the current financial year was under-estimated and more calls were logged than anticipated as there were lot of challenges experienced with the introduction of the system.

In relation to Infrastructure Maintenance, the ageing infrastructure mostly for the observation network infrastructure (AWS, ARS, LDN, Radar, Solar Radiation, and Webcams) has increased cost for maintenance. It is easily manageable for routine/planned maintenance.

For Equipment expensed, the overspending is due to the purchase of Radiosondes and upper-air balloons to support the observations. These costs were previously sponsored by the UK Met Authority for Gough Island, however the UK Met stopped funding the project.

The electricity cost which includes cost of fuel for diesel backup to infrastructure increased due to increased usage as a result of the old infrastructure causing increased consumption in energy due to breakdowns where more diesel was utilised.

The ageing and old infrastructure which is inefficient has also contributed to increased electricity costs as the older the machines become, the more power they tend to consume. Furthermore, the load shedding has resulted in increased spending on fuel to back up the electricity. The approved tariff from the National Energy Regulator of South Africa increased by a much higher percentage compared to the initially projected increase.

The Compensation of Employees is above the budget of R267,79,89m by R13,34m (Actual: R281,13m).

1.6 Depreciation and Amortisation

Total depreciation and amortisation for the year amounted to R28,65m which is below budget by R10,42m, largely due to lower spending on infrastructure investment than originally planned.

1.7 Fair Value Adjustments

The SAWS undeveloped land situated in Garsfontein, Pretoria was evaluated by Independent Valuators as at 31 March 2020 and the value of the portion earmarked for commercial investment increased by R2,50m from R69,28 m to R71,78m.

An actuarial gain of R1,61m was realised on the Post-retirement medical aid obligation, which is a defined benefit plan. The obligation of SAWS towards this benefit plan is on pensioned members and members currently in-service.

SAWS has decreased its Post-Retirement Medical Aid liability from R4,13m in the 2018/19 financial year to R2,64m in the current financial year.

ACCOUNTING POLICIES

2. Presentation of Annual Financial Statements

The annual financial statements have been prepared in accordance with the Standards of Generally Recognised Accounting Practice (GRAP), issued by the Accounting Standards Board in accordance with Section 91(1) of the Public Finance Management Act (Act 1 of 1999).

These annual financial statements have been prepared on an accrual basis of accounting and are in accordance with historical cost convention as the basis of measurement, unless specified otherwise. They are presented in South African Rand.

Assets, liabilities, revenues and expenses were not offset, except where offsetting is either required or permitted by a Standard of GRAP.

A summary of the significant accounting policies, which have been consistently applied in the preparation of these annual financial statements, are disclosed below.

These accounting policies are consistent with the previous period.

2.1 Presentation currency

These annual financial statements are presented in South African Rand, which is the functional currency of the entity.

2.2 Going concern assumption

These annual financial statements have been prepared based on the expectation that the entity will continue to operate as a going concern for at least the next 12 months.

2.3 Significant judgements and sources of estimation uncertainty

In preparing the annual financial statements, management is required to make estimates and assumptions that affect the amounts represented in the annual financial statements and related disclosures. Use of available information and the application of judgement is inherent in the formation of estimates. Actual results in the future could differ from these estimates, which may be material to the annual financial statements. Significant judgements include:

Trade receivables

The entity assesses its trade receivables for impairment at the end of each reporting period. In determining whether an impairment loss should be recorded in surplus or deficit, the entity makes judgements as to whether there is observable data indicating a measurable decrease in the estimated future cash flows from a financial asset.

The impairment for trade receivables is calculated on a portfolio basis, based on historical loss ratios, adjusted for national and industry-specific economic conditions and other indicators present at the reporting date that correlate with defaults on the portfolio. These annual loss ratios are applied to loan balances in the portfolio and scaled to the estimated loss emergence period.

Fair value estimation

The carrying value less impairment provision of trade receivables and payables are assumed to approximate their fair values. The fair value of financial liabilities for disclosure purposes is estimated by discounting the future contractual cash flows at the current market interest rate that is available to the entity for similar financial instruments. Impairment testing of non-financial assets.

The recoverable amounts of cash-generating units and individual assets have been determined based on the higher of value-in-use calculations and fair values less costs to sell. These calculations require the use of estimates and assumptions. It is reasonably possible that the assumption may change which may then impact our estimations and may then require a material adjustment to the carrying value of goodwill and tangible assets.

Provisions

Provisions were raised and management determined an estimate based on the information available. Additional disclosure of these estimates of provisions are included in note 16 - Provisions.

Post-retirement benefits

The present value of the post retirement obligation depends on a number of factors that are determined on an actuarial basis using a number of assumptions. The assumptions

2.3 Significant judgements and sources of estimation uncertainty (continued)

used in determining the net cost (income) include the discount rate. Any changes in these assumptions will impact on the carrying amount of post retirement obligations.

The entity determines the appropriate discount rate at the end of each year. This is the interest rate that should be used to determine the present value of estimated future cash outflows expected to be required to settle the pension obligations. In determining the appropriate discount rate, the entity considers the interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid, and that have terms to maturity approximating the terms of the related pension liability.

Other key assumptions for pension obligations are based on current market conditions. Additional information is disclosed in Note 14.

Allowance for doubtful debts

Trade receivables which are past due are not automatically considered to be impaired. Management's judgement is used to impair amounts that are past due based on being satisfied that all reasonable steps have been taken to recover the debt or that the recovery of the debt would be uneconomical; or the recovery would cause undue hardship to the debtor or his or her dependents; or it would be to the advantage of the state to effect a settlement or waive the claim.

Revaluations

Significant assumptions, in determining fair values of revalued items of Property, Plant and Equipment; and investment property are applied using industry methodologies to determine valuations based on the entity specific or observable market input coupled with assumptions on future expectations.

Useful lives of property, plant and equipment

The entity's management determines the estimated useful lives and related depreciation charges for property, plant and equipment and other assets. This estimate is based on the industry norm. This estimate is further based on the pattern in which an asset's future economic benefits or service potential is expected to be consumed by the entity.

2.4 Investment property

Investment property is property (land or a building - or part of a building - or both) held to earn rentals or for capital appreciation or both, rather than for:

- use in the production or supply of goods or services; or for
- administrative purposes; or
- sale in the ordinary course of operations.

Owner-occupied property is property held for use in the production or supply of goods or services or for administrative purposes.

Investment property is recognised as an asset when it is probable that the future economic benefits or service potential that are associated with the investment property will flow to the entity, and the cost or fair value of the investment property can be measured reliably.

Investment property is initially recognised at cost. Transaction costs are included in the initial measurement.

Where investment property is acquired through a non-exchange transaction, its cost is its fair value as at the date of acquisition.

Costs include costs incurred initially and costs incurred subsequently to add to, or to replace a part of, or service a property. If a replacement part is recognised in the carrying amount of the investment property, the carrying amount of the replaced part is derecognised.

No property is held by the entity under operating leases is accounted for as investment property.

Fair value

Subsequent to initial measurement investment property is measured at fair value.

The fair value of investment property reflects market conditions at the reporting date.

A gain or loss arising from a change in fair value is included in net surplus or deficit for the period in which it arises.

ACCOUNTING POLICIES

2.4 Investment property (continued)

If the entity determines that the fair value of an investment property under construction is not reliably determinable but expects the fair value of the property to be reliably measurable when construction is complete, it measures that investment property under construction at cost until either its fair value becomes reliably determinable or construction is completed (whichever is earlier). If the entity determines that the fair value of an investment property (other than an investment property under construction) is not reliably determinable on a continuing basis, the entity measures that investment property using the cost model (as per the accounting policy on Property, plant and equipment). The residual value of the investment property is then assumed to be zero. The entity applies the cost model (as per the accounting policy on Property, plant and equipment) until disposal of the investment property.

Once the entity becomes able to measure reliably the fair value of an investment property under construction that has previously been measured at cost, it measures that property at its fair value. Once construction of that property is complete, it is presumed that fair value can be measured reliably. If this is not the case, the property is accounted for using the cost model in accordance with the accounting policy on Property, plant and equipment.

2.5 Property, plant and equipment

Property, plant and equipment are tangible non-current assets (including infrastructure assets) that are held for use in the production or supply of goods or services, rental to others, or for administrative purposes, and are expected to be used during more than one period.

The cost of an item of property, plant and equipment is recognised as an asset when:

- it is probable that future economic benefits or service potential associated with the item will flow to the entity; and
- the cost or fair value of the item can be measured reliably.

Property, plant and equipment are initially measured at cost.

The cost of an item of property, plant and equipment is the purchase price and other costs attributable to bring the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Trade discounts and rebates are deducted in arriving at the cost.

Where an asset is acquired through a non-exchange transaction, its cost is its fair value as at date of acquisition. Where an item of property, plant and equipment is acquired in exchange for a non-monetary asset or monetary assets, or a combination of monetary and non-monetary assets, the asset acquired is initially measured at fair value (the cost). If the acquired item's fair value was not determinable, its deemed cost is the carrying amount of the asset(s) given up.

When significant components of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Costs include costs incurred initially to acquire or construct an item of property, plant and equipment and costs incurred subsequently to add to, replace part of, or service it. If a replacement cost is recognised in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognised.

The initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located is also included in the cost of property, plant and equipment, where the entity is obligated to incur such expenditure, and where the obligation arises as a result of acquiring the asset or using it for purposes other than the production of inventories.

Recognition of costs in the carrying amount of an item of property, plant and equipment ceases when the item is in the location and condition necessary for it to be capable of operating in the manner intended by management.

Items such as spare parts, standby equipment and servicing equipment are recognised when they meet the definition of property, plant and equipment.

ACCOUNTING POLICIES

2.5 Property, plant and equipment (continued)

Major inspection costs which are a condition of continuing use of an item of property, plant and equipment and which meet the recognition criteria above are included as a replacement in the cost of the item of property, plant and equipment. Any remaining inspection costs from the previous inspection are derecognised.

Property, plant and equipment excluding Land, Buildings and Aircraft are carried at cost less accumulated depreciation and any impairment losses.

Land, Buildings and Aircraft are carried at revalued amount, being the fair value at the date of revaluation less any subsequent accumulated depreciation and subsequent accumulated impairment losses.

Revaluations are made with sufficient regularity such that the carrying amount does not differ materially from that which would be determined using fair value at the end of the reporting period.

When an item of property, plant and equipment is revalued, any accumulated depreciation at the date of the revaluation is restated proportionately with the change in the gross carrying amount of the asset so that the carrying amount of the asset after revaluation equals its revalued amount.

When an item of property, plant and equipment is revalued, any accumulated depreciation at the date of the revaluation is eliminated against the gross carrying amount of the asset and the net amount restated to the revalued amount of the asset.

Any increase in an asset's carrying amount, as a result of a revaluation, is credited directly to a revaluation surplus. The increase is recognised in surplus or deficit to the extent that it reverses a revaluation decrease of the same asset previously recognised in surplus or deficit.

Any decrease in an asset's carrying amount, as a result of a revaluation, is recognised in surplus or deficit in the current period. The decrease is debited directly to a revaluation surplus to the extent of any credit balance existing in the revaluation surplus in respect of that asset.

The revaluation surplus in equity related to a specific item of property, plant and equipment is transferred directly to retained earnings or deficit when the asset is derecognised. The revaluation surplus in equity related to a specific item of property, plant and equipment is transferred directly to retained earnings as the asset is used. The amount transferred is equal to the difference between depreciation based on the revalued carrying amount and depreciation based on the original cost of the asset.

Property, plant and equipment are depreciated on the straight-line basis over their expected useful lives to their estimated residual value.

The useful lives of items of property, plant and equipment have been assessed as follows:

Item	Depreciation method	Average useful life
Aircraft - Airframes	Straight-line	20 years
Aircraft - Engines	Straight-line	5400 hours
Aircraft - Propellers	Straight-line	5-20 years
Air quality equipment	Straight-line	10-50 years
Buildings	Straight-line	40-50 years
Fences	Straight-line	10-30 years
Furniture and fittings	Straight-line	4-21 years
IT equipment	Straight-line	2-30 years
Leasehold assets	Straight-line	5-50 years
Library books and equipment	Straight-line	10-20 years
Meteorological equipment	Straight-line	10-30 years
Motor vehicles	Straight-line	5-20 years

The depreciable amount of an asset is allocated on a systematic basis over its useful life.

Each part of an item of property, plant and equipment with a cost that is significant in relation to the total cost of the item is depreciated separately.

The depreciation method used reflects the pattern in which the asset's future economic benefits or service potential are expected to be consumed by the entity. The depreciation method applied to an asset is reviewed at least at each reporting date and, if there has been a significant change in the expected pattern of consumption of the future economic benefits or service potential embodied in the asset, the method is changed to reflect the changed pattern. Such a change is accounted for as a change in an accounting estimate.

The entity assesses at each reporting date whether there is any indication that the entity's expectations about the

ACCOUNTING POLICIES

2.5 Property, plant and equipment (continued)

residual value and the useful life of an asset have changed since the preceding reporting date. If any such indication exists, the entity revises the expected useful life and/or residual value accordingly. The change is accounted for as a change in an accounting estimate.

The depreciation charge for each period is recognised in surplus or deficit unless it is included in the carrying amount of another asset.

Items of property, plant and equipment are derecognised when the asset is disposed of or when there are no further economic benefits or service potential expected from the use of the asset.

The gain or loss arising from the derecognition of an item of property, plant and equipment is included in surplus or deficit when the item is derecognised. The gain or loss arising from the derecognition of an item of property, plant and equipment is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.

Assets which the entity holds for rentals to others and subsequently routinely sell as part of the ordinary course of activities, are transferred to inventories when the rentals end and the assets are available-for-sale. Proceeds from sales of these assets are recognised as revenue. All cash flows on these assets are included in cash flows from operating activities in the cash flow statement.

The entity separately discloses expenditure to repair and maintain property, plant and equipment in the notes to the annual financial statements (see note 26).

The entity discloses relevant information relating to assets under construction or development, in the notes to the annual financial statements (see note 9 and note 10).

2.6 Intangible assets

An intangible asset is an identifiable, non-monetary asset without physical substance. The entity has classified the assets listed below as intangible assets.

An asset is identifiable if it either:

- is separable, i.e. is capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, identifiable assets or liability, regardless of whether the entity intends to do so; or
- arises from binding arrangements (including rights from contracts), regardless of whether those rights are transferable or separable from the entity or from other rights and obligations.

A binding arrangement describes an arrangement that confers similar rights and obligations on the parties to it as if it were in the form of a contract.

An intangible asset is recognised when:

- it is probable that the expected future economic benefits or service potential that are attributable to the asset will flow to the entity; and
- the cost or fair value of the asset can be measured reliably.

The entity assesses the probability of expected future economic benefits or service potential using reasonable and supportable assumptions that represent management's best estimate of the set of economic conditions that will exist over the useful life of the asset.

Where an intangible asset is acquired through a non-exchange transaction, its initial cost at the date of acquisition is measured at its fair value as at that date.

Expenditure on research (or on the research phase of an internal project) is recognised as an expense when it is incurred.

An intangible asset arising from development (or from the development phase of an internal project) is recognised when:

- it is technically feasible to complete the asset so that it will be available for use or sale;
- there is an intention to complete and use or sell it;
- there is an ability to use or sell it;
- it will generate probable future economic benefits or service potential;
- there are available technical, financial and other resources to complete the development and to use or sell the asset; and
- the expenditure attributable to the asset during its development can be measured reliably.

ACCOUNTING POLICIES

2.6 Intangible assets (continued)

Intangible assets are carried at cost less any accumulated amortisation and any impairment losses.

An intangible asset is regarded as having an indefinite useful life when, based on all relevant factors, there is no foreseeable limit to the period over which the asset is expected to generate net cash inflows or service potential. Amortisation is not provided for these intangible assets, but they are tested for impairment annually and whenever there is an indication that the asset may be impaired. For all other intangible assets amortisation is provided on a straight line basis over their useful life.

The amortisation period and the amortisation method for intangible assets are reviewed at each reporting date.

Reassessing the useful life of an intangible asset with a finite useful life after it was classified as indefinite is an indicator that the asset may be impaired. As a result the asset is tested for impairment and the remaining carrying amount is amortised over its useful life.

Amortisation is provided to write down the intangible assets, on a straight line basis, to their residual values as follows:

Item	Depreciation method	Average useful life
Computer software	Straight-line	5-30 years
Servitude	Straight-line	25 years

Intangible assets are derecognised:

- on disposal; or
- when no future economic benefits or service potential are expected from its use or disposal.

The gain or loss arising from the derecognition of an intangible asset is included in surplus or deficit when the asset is derecognised (unless the Standard of GRAP on leases requires otherwise on a sale and leaseback).

2.7 Heritage assets

The entity has acknowledged a heritage asset in line with GRAP 103 based on the historical and significance of its scientific information, and the impact thereof on the environment. The entity is the only institution legislated by Government in the country to provide early warning, climate and air-quality information to the public as legislated by Parliament through the SAWS Act. The intellectual and scientific information at the entity's disposal is over 150 years old and will benefit future generations and, as such, needs to be protected and preserved. For an asset to fulfil the requirements of being classisfied as a heritage asset, it has to meet the recognition criteria as set out in GRAP 103 which include reliable measurement of the cost of the heritage asset. Where an entity is unable to measure reliably the cost of the heritage asset, the statement requires that such an asset should be disclosed in the Annual Financial Statements. SAWS cannot reliably provide an estimate of the cost of its heritage asset, therefore none has been recognised in the annual financial statements.

2.8 Financial instruments

A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or a residual interest of another entity.

The amortised cost of a financial asset or financial liability is the amount at which the financial asset or financial liability is measured at initial recognition minus principal repayments, plus or minus the cumulative amortisation using the effective interest method of any difference between that initial amount and the maturity amount, and minus any reduction (directly or through the use of an allowance account) for impairment or uncollectability.

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation.

Currency risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates.

Derecognition is the removal of a previously recognised financial asset or financial liability from an entity's statement of financial position.

A derivative is a financial instrument or other contract with all three of the following characteristics:

- Its value changes in response to the change in a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of

ACCOUNTING POLICIES

2.8 Financial instruments (continued)

prices or rates, credit rating or credit index, or other variable, provided in the case of a non-financial variable that the variable is not specific to a party to the contract (sometimes called the 'underlying').
- It requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors.
- It is settled at a future date.

The effective interest method is a method of calculating the amortised cost of a financial asset or a financial liability (or group of financial assets or financial liabilities) and of allocating the interest income or interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial instrument or, when appropriate, a shorter period to the net carrying amount of the financial asset or financial liability.

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable willing parties in an arm's length transaction.

A financial asset is:
- cash;
- a residual interest of another entity; or
- a contractual right to:
  - receive cash or another financial asset from another entity; or
  - exchange financial assets or financial liabilities with another entity under conditions that are potentially favourable to the entity.

A financial guarantee contract is a contract that requires the issuer to make specified payments to reimburse the holder for a loss it incurs because a specified debtor fails to make payment when due in accordance with the original or modified terms of a debt instrument.

A financial liability is any liability that is a contractual obligation to:
- deliver cash or another financial asset to another entity; or
- exchange financial assets or financial liabilities under conditions that are potentially unfavourable to the entity.

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates.

Liquidity risk is the risk encountered by an entity in the event of difficulty in meeting obligations associated with financial liabilities that are settled by delivering cash or another financial asset.

Market risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risk comprises three types of risk: currency risk, interest rate risk and other price risk.

Other price risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices (other than those arising from interest rate risk or currency risk), whether those changes are caused by factors specific to the individual financial instrument or its issuer, or factors affecting all similar financial instruments traded in the market.

A financial asset is past due when a counterparty has failed to make a payment when contractually due.

A residual interest is any contract that manifests an interest in the assets of an entity after deducting all of its liabilities. A residual interest includes contributions from owners, which may be shown as:
- equity instruments or similar forms of unitised capital;
- a formal designation of a transfer of resources (or a class of such transfers) by the parties to the transaction as forming part of an entity's net assets, either before the contribution occurs or at the time of the contribution; or
- a formal agreement, in relation to the contribution, establishing or increasing an existing financial interest in the net assets of an entity.

Transaction costs are incremental costs that are directly attributable to the acquisition, issue or disposal of a financial asset or financial liability. An incremental cost is one that would not have been incurred if the entity had not acquired, issued or disposed of the financial instrument.

Financial instruments at amortised cost are non-derivative financial assets or non-derivative financial liabilities that have fixed or determinable payments, excluding those instruments that:

ACCOUNTING POLICIES

2.8 Financial instruments (continued)

- the entity designates at fair value at initial recognition; or
- are held for trading.

Financial instruments at cost are investments in residual interests that do not have a quoted market price in an active market, and whose fair value cannot be reliably measured. Financial instruments at fair value comprise financial assets or financial liabilities that are:

- derivatives;
- contingent consideration of an acquirer in a transfer of functions between entities not under common control to which the Standard of GRAP on Transfer of Functions Between Entities Not Under Common Control (GRAP 106) applies;
- combined instruments that are designated at fair value;
- instruments held for trading. A financial instrument is held for trading if:
  - it is acquired or incurred principally for the purpose of selling or repurchasing it in the near-term; or
  - on initial recognition it is part of a portfolio of identified financial instruments that are managed together and for which there is evidence of a recent actual pattern of short term profit-taking;
  - non-derivative financial assets or financial liabilities with fixed or determinable payments that are designated at fair value at initial recognition; and
  - financial instruments that do not meet the definition of financial instruments at amortised cost or financial instruments at cost.

Classification

The entity has the following types of financial assets (classes and category) as reflected on the face of the statement of financial position or in the notes thereto:

`

Class	Category
Cash and cash equivalents	Financial asset measured at amortised cost
Trade and other receivables from exchange transactions	Financial asset measured at amortised cost

The entity has the following types of financial liabilities (classes and category) as reflected on the face of the statement of financial position or in the notes thereto:

`

Class	Category
Trade and other payables from exchange transactions	Financial liability measured at amortised cost
Unspent conditional grants and receipts	Financial liability measured at amortised cost
Unspent government grant - CAPEX	Financial liability measured at amortised cost

Initial recognition

The entity recognises a financial asset or a financial liability in its statement of financial position when the entity becomes a party to the contractual provisions of the instrument.

The entity recognises financial assets using trade date accounting.

Initial measurement of financial assets and financial liabilities
The entity measures a financial asset and financial liability initially at its fair value plus transaction costs that are directly attributable to the acquisition or issue of the financial asset or financial liability, except for financial instruments subsequently measured at fair value, which are measured at its fair value.

The entity measures a financial asset and financial liability initially at its fair value [if subsequently measured at fair value].

Subsequent measurement of financial assets and financial liabilities

The entity measures all financial assets and financial liabilities after initial recognition using the following categories:

- Financial instruments at fair value.
- Financial instruments at amortised cost.
- Financial instruments at cost.

All financial assets measured at amortised cost, or cost, are subject to an impairment review.

Fair value measurement considerations

The best evidence of fair value is quoted prices in an active market. If the market for a financial instrument is not active, the entity establishes fair value by using a valuation technique. The objective of using a valuation technique is to establish what the transaction price would have been on the measurement date in an arm's length exchange

ACCOUNTING POLICIES

2.8 Financial instruments (continued)

motivated by normal operating considerations. Valuation techniques include using recent arm's length market transactions between knowledgeable, willing parties, if available, reference to the current fair value of another instrument that is substantially the same, discounted cash flow analysis and option pricing models. If there is a valuation technique commonly used by market participants to price the instrument and that technique has been demonstrated to provide reliable estimates of prices obtained in actual market transactions, the entity uses that technique. The chosen valuation technique makes maximum use of market inputs and relies as little as possible on entity-specific inputs. It incorporates all factors that market participants will consider in setting a price and is consistent with accepted economic methodologies for pricing financial instruments. Periodically, the entity calibrates the valuation technique and tests it for validity using prices from any observable current market transactions in the same instrument (i.e. without modification or repackaging) or based on any available observable market data.

The fair value of a financial liability with a demand feature (e.g. a demand deposit) is not less than the amount payable on demand, discounted from the first date that the amount could be required to be paid.

Reclassification

The entity does not reclassify a financial instrument while it is issued or held unless it is:

- a combined instrument that is required to be measured at fair value; or
- an investment in a residual interest that meets the requirements for reclassification.

Where the entity cannot reliably measure the fair value of an embedded derivative that has been separated from a host contract that is a financial instrument at a subsequent reporting date, it measures the combined instrument at fair value. This requires a reclassification of the instrument from amortised cost or cost to fair value.

If fair value can no longer be measured reliably for an investment in a residual interest measured at fair value, the entity reclassifies the investment from fair value to cost. The carrying amount at the date that fair value is no longer available becomes the cost.

If a reliable measure becomes available for an investment in a residual interest for which a measure was previously not available, and the instrument would have been required to be measured at fair value, the entity reclassifies the instrument from cost to fair value.

Gains and losses

A gain or loss arising from a change in the fair value of a financial asset or financial liability measured at fair value is recognised in surplus or deficit.

For financial assets and financial liabilities measured at amortised cost or cost, a gain or loss is recognised in surplus or deficit when the financial asset or financial liability is derecognised or impaired, or through the amortisation process.

Impairment and uncollectability of financial assets

The entity assesses at the end of each reporting period whether there is any objective evidence that a financial asset or group of financial assets is impaired.

Financial assets measured at amortised cost:

If there is objective evidence that an impairment loss on financial assets measured at amortised cost has been incurred, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows (excluding future credit losses that have not been incurred) discounted at the financial asset's original effective interest rate. The carrying amount of the asset is reduced directly OR through the use of an allowance account. The amount of the loss is recognised in surplus or deficit.

If, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognised, the previously recognised impairment loss is reversed by adjusting an allowance account. The reversal does not result in a carrying amount of the financial asset that exceeds what the amortised cost would have been had the impairment not been recognised at the date the impairment is reversed. The amount of the reversal is recognised in surplus or deficit.

ACCOUNTING POLICIES

2.8 Financial instruments (continued)

Financial assets measured at cost:

If there is objective evidence that an impairment loss has been incurred on an investment in a residual interest that is not measured at fair value because its fair value cannot be measured reliably, the amount of the impairment loss is measured as the difference between the carrying amount of the financial asset and the present value of estimated future cash flows discounted at the current market rate of return for a similar financial asset. Such impairment losses are not reversed.

Derecognition

Financial assets

The entity derecognises financial assets using trade date accounting.

The entity derecognises a financial asset only when:

- the contractual rights to the cash flows from the financial asset expire, are settled or waived;
- the entity transfers to another party substantially all of the risks and rewards of ownership of the financial asset; or
- the entity, despite having retained some significant risks and rewards of ownership of the financial asset, has transferred control of the asset to another party and the other party has the practical ability to sell the asset in its entirety to an unrelated third party, and is able to exercise that ability unilaterally and without needing to impose additional restrictions on the transfer. In this case, the entity:
  - derecognises the asset; and
  - recognises separately any rights and obligations created or retained in the transfer.

The carrying amounts of the transferred assets are allocated between the rights or obligations retained and those transferred on the basis of their relative fair values at the transfer date. Newly created rights and obligations are measured at their fair values at that date. Any difference between the consideration received and the amounts recognised and derecognised is recognised in surplus or deficit in the period of the transfer.

If the entity transfers a financial asset in a transfer that qualifies for derecognition in its entirety and retains the right to service the financial asset for a fee, it recognise either a servicing asset or a servicing liability for that servicing contract. If the fee to be received is not expected to compensate the entity adequately for performing the servicing, a servicing liability for the servicing obligation is recognised at its fair value. If the fee to be received is expected to be more than adequate compensation for the servicing, a servicing asset is recognised for the servicing right at an amount determined on the basis of an allocation of the carrying amount of the larger financial asset.

If, as a result of a transfer, a financial asset is derecognised in its entirety but the transfer results in the entity obtaining a new financial asset or assuming a new financial liability, or a servicing liability, the entity recognises the new financial asset, financial liability or servicing liability at fair value.

On derecognition of a financial asset in its entirety, the difference between the carrying amount and the sum of the consideration received is recognised in surplus or deficit.

If the transferred asset is part of a larger financial asset and the part transferred qualifies for derecognition in its entirety, the previous carrying amount of the larger financial asset is allocated between the part that continues to be recognised and the part that is derecognised, based on the relative fair values of those parts, on the date of the transfer. For this purpose, a retained servicing asset is treated as a part that continues to be recognised. The difference between the carrying amount allocated to the part derecognised and the sum of the consideration received for the part derecognised is recognised in surplus or deficit.

If a transfer does not result in derecognition because the entity has retained substantially all the risks and rewards of ownership of the transferred asset, the entity continues to recognise the transferred asset in its entirety and recognise a financial liability for the consideration received. In subsequent periods, the entity recognises any revenue on the transferred asset and any expense incurred on the financial liability. Neither the asset, and the associated liability, nor the revenue, and the associated expenses, are offset.

ACCOUNTING POLICIES

2.8 Financial instruments (continued)

Financial liabilities

The entity removes a financial liability (or a part of a financial liability) from its statement of financial position when it is extinguished — i.e. when the obligation specified in the contract is discharged, cancelled, expires or waived.

An exchange between an existing borrower and lender of debt instruments with substantially different terms is accounted for as having extinguished the original financial liability and a new financial liability is recognised. Similarly, a substantial modification of the terms of an existing financial liability or a part of it is accounted for as having extinguished the original financial liability and having recognised a new financial liability.

The difference between the carrying amount of a financial liability (or part of a financial liability) extinguished or transferred to another party and the consideration paid, including any non-cash assets transferred or liabilities assumed, is recognised in surplus or deficit. Any liabilities that are waived, forgiven or assumed by another entity by way of a non-exchange transaction are accounted for in accordance with the Standard of GRAP on Revenue from Non-exchange Transactions (Taxes and Transfers).

Presentation

Interest relating to a financial instrument or a component that is a financial liability is recognised as revenue or expense in surplus or deficit.

Losses and gains relating to a financial instrument or a component that is a financial liability, are recognised as revenue or expense in surplus or deficit.

A financial asset and a financial liability are only offset and the net amount presented in the statement of financial position when the entity currently has a legally enforceable right to set off the recognised amounts and intends either to settle on a net basis, or to realise the asset and settle the liability simultaneously.

In accounting for a transfer of a financial asset that does not qualify for derecognition, the entity does not offset the transferred asset and the associated liability.

2.9 Statutory receivables

Identification

Statutory receivables are receivables that arise from legislation, supporting regulations, or similar means, and require settlement by another entity in cash or another financial asset.

Carrying amount is the amount at which an asset is recognised in the statement of financial position.

The cost method is the method used to account for statutory receivables that requires such receivables to be measured at their transaction amount, plus any accrued interest or other charges (where applicable), and less any accumulated impairment losses and any amounts derecognised.

Nominal interest rate is the interest rate and/or basis specified in legislation, supporting regulations or similar means.

The transaction amount (for purposes of this Standard) for a statutory receivable means the amount specified in, or calculated, levied or charged in accordance with, legislation, supporting regulations, or similar means.

Recognition

The entity recognises statutory receivables as follows:

- if the transaction is an exchange transaction, using the policy on Revenue from exchange transactions;
- if the transaction is a non-exchange transaction, using the policy on Revenue from non-exchange transactions (Taxes and transfers); or
- if the transaction is not within the scope of the policies listed in the above or another Standard of GRAP, the receivable is recognised when the definition of an asset is met and, when it is probable that the future economic benefits or service potential associated with the asset will flow to the entity and the transaction amount can be measured reliably.

Initial measurement

The entity initially measures statutory receivables at their transaction amount.

2.9 Statutory receivables (continued)

Subsequent measurement

The entity measures statutory receivables after initial recognition using the cost method. Under the cost method, the initial measurement of the receivable is changed subsequent to initial recognition to reflect any:

- interest or other charges that may have accrued on the receivable (where applicable);
- impairment losses; and
- amounts derecognised.

Accrued interest

Where the entity levies interest on the outstanding balance of statutory receivables, it adjusts the transaction amount after initial recognition to reflect any accrued interest. Accrued interest is calculated using the nominal interest rate.

Interest on statutory receivables is recognised as revenue in accordance with the policy on Revenue from exchange transactions or the policy on Revenue from non-exchange transactions (Taxes and transfers), whichever is applicable.

Other charges

Where the entity is required or entitled in terms of legislation, supporting regulations, by-laws or similar means to levy additional charges on overdue or unpaid amounts, and such charges are levied, the entity applies the principles as stated in "Accrued interest" above, as well as the relevant policy on Revenue from exchange transactions or the policy on Revenue from non-exchange transactions (Taxes and transfers).

Impairment losses

The entity assesses at each reporting date whether there is any indication that a statutory receivable, or a group of statutory receivables, may be impaired.
In assessing whether there is any indication that a statutory receivable, or group of statutory receivables, may be impaired, the entity considers, as a minimum, the following indicators:

- significant financial difficulty of the debtor, which may be evidenced by an application for debt counselling, business rescue or an equivalent;
- it is probable that the debtor will enter sequestration, liquidation or other financial re-organisation;
- a breach of the terms of the transaction, such as default or delinquency in principal or interest payments (where levied); and
- adverse changes in international, national or local economic conditions, such as a decline in growth, an increase in debt levels and unemployment, or changes in migration rates and patterns.

If there is an indication that a statutory receivable, or a group of statutory receivables, may be impaired, the entity measures the impairment loss as the difference between the estimated future cash flows and the carrying amount. Where the carrying amount is higher than the estimated future cash flows, the carrying amount of the statutory receivable, or group of statutory receivables, is reduced, either directly or through the use of an allowance account. The amount of the losses is recognised in surplus or deficit. In estimating the future cash flows, the entity considers both the amount and timing of the cash flows that it will receive in future. Consequently, where the effect of the time value of money is material, the entity discounts the estimated future cash flows using a rate that reflects the current risk-free rate and, if applicable, any risks specific to the statutory receivable, or group of statutory receivables, for which the future cash flow estimates have not been adjusted.

An impairment loss recognised in prior periods for a statutory receivable is revised if there has been a change in the estimates used since the last impairment loss was recognised, or to reflect the effect of discounting the estimated cash flows.

Any previously recognised impairment loss is adjusted either directly or by adjusting the allowance account. The adjustment does not result in the carrying amount of the statutory receivable or group of statutory receivables exceeding what the carrying amount of the receivable(s) would have been had the impairment loss not been recognised at the date the impairment is revised. The amount of any adjustment is recognised in surplus or deficit.

ACCOUNTING POLICIES

2.9 Statutory receivables (continued)

Derecognition

The entity derecognises a statutory receivable, or a part thereof, when:

- the rights to the cash flows from the receivable are settled, expire or are waived;
- the entity transfers to another party substantially all of the risks and rewards of ownership of the receivable; or
- the entity, despite having retained some significant risks and rewards of ownership of the receivable, has transferred control of the receivable to another party and the other party has the practical ability to sell the receivable in its entirety to an unrelated third party, and is able to exercise that ability unilaterally and without needing to impose additional restrictions on the transfer. In this case, the entity:
  - derecognises the receivable; and
  - recognises separately any rights and obligations created or retained in the transfer.

The carrying amounts of any statutory receivables transferred are allocated between the rights or obligations retained and those transferred on the basis of their relative fair values at the transfer date. The entity considers whether any newly created rights and obligations are within the scope of the Standard of GRAP on Financial instruments or another Standard of GRAP. Any difference between the consideration received and the amounts derecognised and those amounts recognised, are recognised in surplus or deficit in the period of the transfer.

2.10 Tax

Tax expenses

No provision has been made for taxation, as the entity is exempt from income tax in terms of Section 10 of the Income Tax Act, 1962 (No. 58 of 1962).

2.11 Leases

A lease is classified as a finance lease if it transfers substantially all the risks and rewards incidental to ownership. A lease is classified as an operating lease if it does not transfer substantially all the risks and rewards incidental to ownership.

When a lease includes both land and buildings elements, the entity assesses the classification of each element separately.

Operating leases - lessor

Operating lease revenue is recognised as revenue on a straight-line basis over the lease term. The difference between the amounts recognised as revenue and the contractual receipts is recognised as an operating lease asset or liability.

Initial direct costs incurred in negotiating and arranging operating leases are added to the carrying amount of the leased asset and recognised as an expense over the lease term on the same basis as the lease revenue.

The aggregate cost of incentives is recognised as a reduction of rental revenue over the lease term on a straight-line basis.

The aggregate benefit of incentives is recognised as a reduction of rental expense over the lease term on a straight-line basis.

Income for leases is disclosed under revenue in the statement of financial performance.

Operating leases - lessee

Operating lease payments are recognised as an expense on a straight-line basis over the lease term. The difference between the amounts recognised as an expense and the contractual payments are recognised as an operating lease asset or liability.

The aggregate cost of incentives is recognised as a reduction of rental revenue over the lease term on a straight-line basis.

The aggregate benefit of incentives is recognised as a reduction of rental expense over the lease term on a straight-line basis.

ACCOUNTING POLICIES

2.12 Inventories

Inventories are initially measured at cost except where inventories are acquired through a non-exchange transaction, then their costs are their fair value as at the date of acquisition.

Subsequently inventories are measured at the lower of cost and net realisable value.

Inventories are measured at the lower of cost and current replacement cost where they are held for:

- distribution at no charge or for a nominal charge; or
- consumption in the production process of goods to be distributed at no charge or for a nominal charge.

Net realisable value is the estimated selling price in the ordinary course of operations less the estimated costs of completion and the estimated costs necessary to make the sale, exchange or distribution.

Current replacement cost is the cost the entity incurs to acquire the asset on the reporting date.

The cost of inventories comprise all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition.

The cost of inventories of items that are not ordinarily interchangeable and goods or services produced and segregated for specific projects is assigned using specific identification of the individual costs.

The cost of inventories is assigned using the weighted average cost formula. The same cost formula is used for all inventories having a similar nature and use to the entity. When inventories are sold, the carrying amounts of those inventories are recognised as an expense in the period in which the related revenue is recognised. If there is no related revenue, the expenses are recognised when the goods are distributed, or related services are rendered. The amount of any write-down of inventories to net realisable value or current replacement cost and all losses of inventories are recognised as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realisable value or current replacement cost, is recognised as a reduction in the amount of inventories recognised as an expense in the period in which the reversal occurs.

2.13 Impairment of cash-generating assets

Cash-generating assets are assets used with the objective of generating a commercial return. Commercial return means that positive cash flows are expected to be significantly higher than the cost of the asset.

Impairment is a loss in the future economic benefits or service potential of an asset, over and above the systematic recognition of the loss of the asset's future economic benefits or service potential through depreciation (amortisation).

Carrying amount is the amount at which an asset is recognised in the statement of financial position after deducting any accumulated depreciation and accumulated impairment losses thereon.

A cash-generating unit is the smallest identifiable group of assets used with the objective of generating a commercial return that generates cash inflows from continuing use that are largely independent of the cash inflows from other assets or groups of assets.

Costs of disposal are incremental costs directly attributable to the disposal of an asset, excluding finance costs and income tax expense.

Depreciation (Amortisation) is the systematic allocation of the depreciable amount of an asset over its useful life.

Fair value less costs to sell is the amount obtainable from the sale of an asset in an arm's length transaction between knowledgeable, willing parties, less the costs of disposal.

Recoverable amount of an asset or a cash-generating unit is the higher of its fair value less costs to sell and its value in use.

Useful life is either:

- the period of time over which an asset is expected to be used by the entity; or
- the number of production or similar units expected to be obtained from the asset by the entity.

ACCOUNTING POLICIES

2.13 Impairment of cash-generating assets (continued)

Identification

When the carrying amount of a cash-generating asset exceeds its recoverable amount, it is impaired.

The entity assesses at each reporting date whether there is any indication that a cash-generating asset may be impaired. If any such indication exists, the entity estimates the recoverable amount of the asset.

Irrespective of whether there is any indication of impairment, the entity also tests a cash-generating intangible asset with an indefinite useful life or a cash-generating intangible asset not yet available for use for impairment annually by comparing its carrying amount with its recoverable amount. This impairment test is performed at the same time every year. If an intangible asset was initially recognised during the current reporting period, that intangible asset was tested for impairment before the end of the current reporting period.

Value in use

Value in use of a cash-generating asset is the present value of the estimated future cash flows expected to be derived from the continuing use of an asset and from its disposal at the end of its useful life.

When estimating the value in use of an asset, the entity estimates the future cash inflows and outflows to be derived from continuing use of the asset and from its ultimate disposal and the entity applies the appropriate discount rate to those future cash flows.

Basis for estimates of future cash flows

In measuring value in use the entity:

- bases cash flow projections on reasonable and supportable assumptions that represent management's best estimate of the range of economic conditions that will exist over the remaining useful life of the asset. Greater weight is given to external evidence;
- bases cash flow projections on the most recent approved financial budgets/forecasts, but excludes any estimated future cash inflows or outflows expected to arise from future restructuring's or from improving or enhancing the asset's performance. Projections based on these budgets/forecasts cover a maximum period of five years, unless a longer period can be justified; and
- estimates cash flow projections beyond the period covered by the most recent budgets/forecasts by extrapolating the projections based on the budgets/forecasts using a steady or declining growth rate for subsequent years, unless an increasing rate can be justified. This growth rate does not exceed the long-term average growth rate for the products, industries, or country or countries in which the entity operates, or for the market in which the asset is used, unless a higher rate can be justified. Composition of estimates of future cash flows.

Estimates of future cash flows include:

- projections of cash inflows from the continuing use of the asset;
- projections of cash outflows that are necessarily incurred to generate the cash inflows from continuing use of the asset (including cash outflows to prepare the asset for use) and can be directly attributed, or allocated on a reasonable and consistent basis, to the asset; and
- net cash flows, if any, to be received (or paid) for the disposal of the asset at the end of its useful life.

Estimates of future cash flows exclude:

- cash inflows or outflows from financing activities; and
- income tax receipts or payments.

The estimate of net cash flows to be received (or paid) for the disposal of an asset at the end of its useful life is the amount that the entity expects to obtain from the disposal of the asset in an arm's length transaction between knowledgeable, willing parties, after deducting the estimated costs of disposal.

Foreign currency future cash flows

Future cash flows are estimated in the currency in which they will be generated and then discounted using a discount rate appropriate for that currency. The entity translates the present value using the spot exchange rate at the date of the value in use calculation.

ACCOUNTING POLICIES

2.13 Impairment of cash-generating assets (continued)

Discount rate

The discount rate is a pre-tax rate that reflects current market assessments of the time value of money, represented by the current risk-free rate of interest and the risks specific to the asset for which the future cash flow estimates have not been adjusted.

Recognition and measurement (individual asset)

If the recoverable amount of a cash-generating asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. This reduction is an impairment loss.

An impairment loss is recognised immediately in surplus or deficit.

Any impairment loss of a revalued cash-generating asset is treated as a revaluation decrease.

When the amount estimated for an impairment loss is greater than the carrying amount of the cash-generating asset to which it relates, the entity recognises a liability only to the extent that is a requirement in the Standard of GRAP. After the recognition of an impairment loss, the depreciation (amortisation) charge for the cash-generating asset is adjusted in future periods to allocate the cash-generating asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life.

Cash-generating units

If there is any indication that an asset may be impaired, the recoverable amount is estimated for the individual asset. If it is not possible to estimate the recoverable amount of the individual asset, the entity determines the recoverable amount of the cash-generating unit to which the asset belongs (the asset's cash-generating unit).

If an active market exists for the output produced by an asset or group of assets, that asset or group of assets is identified as a cash-generating unit, even if some or all of the output is used internally. If the cash inflows generated by any asset or cash-generating unit are affected by internal transfer pricing, the entity uses management's best estimate of the future price(s) that could be achieved in arm's length transactions in estimating:

- the future cash inflows used to determine the asset's or cash-generating unit's value in use; and
- the future cash outflows used to determine the value in use of any other assets or cash-generating units that are affected by the internal transfer pricing.

Cash-generating units are identified consistently from period to period for the same asset or types of assets, unless a change is justified.

The carrying amount of a cash-generating unit is determined on a basis consistent with the way the recoverable amount of the cash-generating unit is determined.

An impairment loss is recognised for a cash-generating unit if the recoverable amount of the unit is less than the carrying amount of the unit. The impairment is allocated to reduce the carrying amount of the cash-generating assets of the unit on a pro rata basis, based on the carrying amount of each asset in the unit. These reductions in carrying amounts are treated as impairment losses on individual assets.

In allocating an impairment loss, the entity does not reduce the carrying amount of an asset below the highest of:

- its fair value less costs to sell (if determinable);
- its value in use (if determinable); and
- zero.

The amount of the impairment loss that would otherwise have been allocated to the asset is allocated pro rata to the other cash-generating assets of the unit.

Where a non-cash-generating asset contributes to a cash-generating unit, a proportion of the carrying amount of that non-cash-generating asset is allocated to the carrying amount of the cash-generating unit prior to estimation of the recoverable amount of the cash-generating unit.

Reversal of impairment loss

The entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for a cash-generating asset may no longer exist or may have decreased. If any such indication exists, the entity estimates the recoverable amount of that asset.

ACCOUNTING POLICIES

2.13 Impairment of cash-generating assets (continued)

An impairment loss recognised in prior periods for a cash-generating asset is reversed if there has been a change in the estimates used to determine the asset's recoverable amount since the last impairment loss was recognised. The carrying amount of the asset is increased to its recoverable amount. The increase is a reversal of an impairment loss. The increased carrying amount of an asset attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined (net of depreciation or amortisation) had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss for a cash-generating asset is recognised immediately in surplus or deficit.

Any reversal of an impairment loss of a revalued cash-generating asset is treated as a revaluation increase.

After a reversal of an impairment loss is recognised, the depreciation (amortisation) charge for the cash-generating asset is adjusted in future periods to allocate the cash-generating asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life.

A reversal of an impairment loss for a cash-generating unit is allocated to the cash-generating assets of the unit pro rata with the carrying amounts of those assets. These increases in carrying amounts are treated as reversals of impairment losses for individual assets. No part of the amount of such a reversal is allocated to a non-cash-generating asset contributing service potential to a cash-generating unit.

In allocating a reversal of an impairment loss for a cash-generating unit, the carrying amount of an asset is not increased above the lower of:

- its recoverable amount (if determinable); and
- the carrying amount that would have been determined (net of amortisation or depreciation) had no impairment loss been recognised for the asset in prior periods.

The amount of the reversal of the impairment loss that would otherwise have been allocated to the asset is allocated pro rata to the other assets of the unit.

Redesignation

The redesignation of assets from a cash-generating asset to a non-cash-generating asset or from a non-cash-generating asset to a cash-generating asset only occur when there is clear evidence that such a redesignation is appropriate.

2.14 Impairment of non-cash-generating assets

Cash-generating assets are assets used with the objective of generating a commercial return. Commercial return means that positive cash flows are expected to be significantly higher than the cost of the asset.

Non-cash-generating assets are assets other than cash-generating assets.

Identification

When the carrying amount of a non-cash-generating asset exceeds its recoverable service amount, it is impaired.

The entity assesses at each reporting date whether there is any indication that a non-cash-generating asset may be impaired. If any such indication exists, the entity estimates the recoverable service amount of the asset.

Irrespective of whether there is any indication of impairment, the entity also tests a non-cash-generating intangible asset with an indefinite useful life or a non-cash-generating intangible asset not yet available for use for impairment annually by comparing its carrying amount with its recoverable service amount. This impairment test is performed at the same time every year. If an intangible asset was initially recognised during the current reporting period, that intangible asset was tested for impairment before the end of the current reporting period.

Value in use

Value in use of non-cash-generating assets is the present value of the non-cash-generating assets remaining service potential.

The present value of the remaining service potential of a non-cash-generating assets is determined using the following approach:

ACCOUNTING POLICIES

2.14 Impairment of non-cash-generating assets (continued)

Service units approach

The present value of the remaining service potential of the asset is determined by reducing the current cost of the remaining service potential of the asset before impairment, to conform to the reduced number of service units expected from the asset in its impaired state. The current cost of replacing the remaining service potential of the asset before impairment is determined as the depreciated reproduction or replacement cost of the asset before impairment, whichever is lower.

Recognition and measurement

If the recoverable service amount of a non-cash-generating asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable service amount. This reduction is an impairment loss.

An impairment loss is recognised immediately in surplus or deficit.

Any impairment loss of a revalued non-cash-generating asset is treated as a revaluation decrease.

When the amount estimated for an impairment loss is greater than the carrying amount of the non-cash-generating asset to which it relates, the entity recognises a liability only to the extent that is a requirement in the Standards of GRAP.

After the recognition of an impairment loss, the depreciation (amortisation) charge for the non-cash-generating asset is adjusted in future periods to allocate the non-cash-generating asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life.

Reversal of an impairment loss

The entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for a non-cash-generating asset may no longer exist or may have decreased. If any such indication exists, the entity estimates the recoverable service amount of that asset.

An impairment loss recognised in prior periods for a non-cash-generating asset is reversed if there has been a change in the estimates used to determine the asset's recoverable service amount since the last impairment loss was recognised. The carrying amount of the asset is increased to its recoverable service amount. The increase is a reversal of an impairment loss. The increased carrying amount of an asset attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined (net of depreciation or amortisation) had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss for a non-cash-generating asset is recognised immediately in surplus or deficit.

Any reversal of an impairment loss of a revalued non-cash-generating asset is treated as a revaluation increase.

After a reversal of an impairment loss is recognised, the depreciation (amortisation) charge for the non-cash-generating asset is adjusted in future periods to allocate the non-cash-generating asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life.

Redesignation

The redesignation of assets from a cash-generating asset to a non-cash-generating asset or from a non-cash-generating asset to a cash-generating asset only occurs when there is clear evidence that such a redesignation is appropriate.

2.15 Employee benefits

Employee benefits are all forms of consideration given by the entity in exchange for service rendered by employees.
A qualifying insurance policy is an insurance policy issued by an insurer that is not a related party (as defined in the Standard of GRAP on Related Party Disclosures) of the reporting entity, if the proceeds of the policy can be used only to pay or fund employee benefits under a defined benefit plan and are not available to the reporting entity's own creditors (even in liquidation) and cannot be paid to the reporting entity, unless either:

- the proceeds represent surplus assets that are not needed for the policy to meet all the related employee benefit obligations; or

ACCOUNTING POLICIES

2.15 Employee benefits (continued)

- the proceeds are returned to the reporting entity to reimburse it for employee benefits already paid.
-

Termination benefits are employee benefits payable as a result of either:

- the entity's decision to terminate an employee's employment before the normal retirement date; or
- an employee's decision to accept voluntary redundancy in exchange for those benefits.

Other long-term employee benefits are employee benefits (other than post-employment benefits and termination benefits) that are not due to be settled within twelve months after the end of the period in which the employees render the related service.

Vested employee benefits are employee benefits that are not conditional on future employment.

Composite social security programmes are established by legislation and operate as multi-employer plans to provide postemployment benefits as well as to provide benefits that are not consideration in exchange for services rendered by employees.

A constructive obligation is an obligation that derives from the entity's actions whereby an established pattern of past practice, published policies or a sufficiently specific current statement, the entity has indicated to other parties that it will accept certain responsibilities and as a result, the entity has created a valid expectation on the part of those other parties that it will discharge those responsibilities.

Short-term employee benefits

Short-term employee benefits are employee benefits (other than termination benefits) that are due to be settled within 12 months after the end of the period in which the employees render the related service.

Short-term employee benefits include items such as:

- wages, salaries and social security contributions;
- short-term compensated absences (such as paid annual leave and paid sick leave) where the compensation for the absences is due to be settled within 12 months after the end of the reporting period in which the employees render the related employee service;
- bonus, incentive and performance related payments payable within 12 months after the end of the reporting period in which the employees render the related service; and
- non-monetary benefits (for example, medical care, and free or subsidised goods or services such as housing, cars and cellphones) for current employees.
- When an employee has rendered service to the entity during a reporting period, the entity recognises the undiscounted amount of short-term employee benefits expected to be paid in exchange for that service:
- as a liability (accrued expense), after deducting any amount already paid. If the amount already paid exceeds the undiscounted amount of the benefits, the entity recognises that excess as an asset (prepaid expense) to the extent that the prepayment will lead to, for example, a reduction in future payments or a cash refund; and
- as an expense, unless another Standard requires or permits the inclusion of the benefits in the cost of an asset.

The expected cost of compensated absences is recognised as an expense as the employees render services that increase their entitlement or, in the case of non-accumulating absences, when the absence occurs. The entity measures the expected cost of accumulating compensated absences as the additional amount that the entity expects to pay as a result of the unused entitlement that has accumulated at the reporting date.

The entity recognises the expected cost of bonus, incentive and performance related payments when the entity has a present legal or constructive obligation to make such payments as a result of past events and a reliable estimate of the obligation can be made. A present obligation exists when the entity has no realistic alternative but to make the payments.

Post-employment benefits

Post-employment benefits are employee benefits (other than termination benefits) which are payable after the completion of employment.

Post-employment benefit plans are formal or informal arrangements under which the entity provides post-employment benefits for one or more employees.

ACCOUNTING POLICIES

2.15 Employee benefits (continued)

Post-employment benefits: Defined benefit plans

Defined benefit plans are post-employment benefit plans other than defined contribution plans.

Actuarial gains and losses comprise experience adjustments (the effects of differences between the previous actuarial assumptions and what has actually occurred) and the effects of changes in actuarial assumptions. In measuring its defined benefit liability the entity recognises actuarial gains and losses in surplus or deficit in the reporting period in which they occur.

Assets held by a long-term employee benefit fund are assets (other than non-transferable financial instruments issued by the reporting entity) that are held by an entity (a fund) that is legally separate from the reporting entity and exists solely to pay or fund employee benefits and are available to be used only to pay or fund employee benefits, are not available to the reporting entity's own creditors (even in liquidation), and cannot be returned to the reporting entity, unless either:

- the remaining assets of the fund are sufficient to meet all the related employee benefit obligations of the plan or the reporting entity; or
- the assets are returned to the reporting entity to reimburse it for employee benefits already paid.

Current service cost is the increase in the present value of the defined benefit obligation resulting from employee service in the current period.

Interest cost is the increase during a period in the present value of a defined benefit obligation which arises because the benefits are one period closer to settlement.

Past service cost is the change in the present value of the defined benefit obligation for employee service in prior periods, resulting in the current period from the introduction of, or changes to, post-employment benefits or other long-term employee benefits. Past service cost may be either positive (when benefits are introduced or changed so that the present value of the defined benefit obligation increases) or negative (when existing benefits are changed so that the present value of the defined benefit obligation decreases). In measuring its defined benefit liability the entity recognises past service cost as an expense in the reporting period in which the plan is amended.

Plan assets comprise assets held by a long-term employee benefit fund and qualifying insurance policies.

The present value of a defined benefit obligation is the present value, without deducting any plan assets, of expected future payments required to settle the obligation resulting from employee service in the current and prior periods.

The return on plan assets is interest, dividends or similar distributions and other revenue derived from the plan assets, together with realised and unrealised gains or losses on the plan assets, less any costs of administering the plan (other than those included in the actuarial assumptions used to measure the defined benefit obligation) and less any tax payable by the plan itself.

The entity accounts not only for its legal obligation under the formal terms of a defined benefit plan, but also for any constructive obligation that arises from the entity's informal practices. Informal practices give rise to a constructive obligation where the entity has no realistic alternative but to pay employee benefits. An example of a constructive obligation is where a change in the entity's informal practices would cause unacceptable damage to its relationship with employees.

The amount recognised as a defined benefit liability is the net total of the following amounts:

- the present value of the defined benefit obligation at the reporting date;
- minus the fair value at the reporting date of plan assets (if any) out of which the obligations are to be settled directly;
- plus any liability that may arise as a result of a minimum funding requirement
- The amount determined as a defined benefit liability may be negative (an asset). The entity measures the resulting asset at the lower of:
- the amount determined above; and
- the present value of any economic benefits available in the form of refunds from the plan or reductions in future contributions to the plan. The present value of these economic benefits is determined using a discount rate which reflects the time value of money.

ACCOUNTING POLICIES

2.15 Employee benefits (continued)

Any adjustments arising from the limit above is recognised in surplus or deficit.

The entity determines the present value of defined benefit obligations and the fair value of any plan assets (if any) with sufficient regularity such that the amounts recognised in the annual financial statements do not differ materially from the amounts that would be determined at the reporting date.

The entity recognises the net total of the following amounts in surplus or deficit, except to the extent that another Standard requires or permits their inclusion in the cost of an asset:

- current service cost;
- interest cost;
- the expected return on any plan assets and on any reimbursement rights;
- actuarial gains and losses;
- past service cost;
- the effect of any curtailments or settlements; and
- the effect of applying the limit on a defined benefit asset (negative defined benefit liability).

The entity uses the Projected Unit Credit Method to determine the present value of its defined benefit obligations and the related current service cost and, where applicable, past service cost. The Projected Unit Credit Method (sometimes known as the accrued benefit method pro-rated on service or as the benefit/years of service method) sees each period of service as giving rise to an additional unit of benefit entitlement and measures each unit separately to build up the final obligation.

In determining the present value of its defined benefit obligations and the related current service cost and, where applicable, past service cost, the entity attributes benefit to periods of service under the plan's benefit formula. However, if an employee's service in later years will lead to a materially higher level of benefit than in earlier years, the entity attributes benefit on a straight-line basis from:

- the date when service by the employee first leads to benefits under the plan (whether or not the benefits are conditional on further service); until
- the date when further service by the employee will lead to no material amount of further benefits under the plan, other than from further salary increases.

Actuarial valuations are conducted on an annual basis by independent actuaries separately for each plan. The results of the valuation are updated for any material transactions and other material changes in circumstances (including changes in market prices and interest rates) up to the reporting date.

The entity recognises gains or losses on the curtailment or settlement of a defined benefit plan when the curtailment or settlement occurs. The gain or loss on a curtailment or settlement comprises:

- any resulting change in the present value of the defined benefit obligation; and
- any resulting change in the fair value of the plan assets.

Before determining the effect of a curtailment or settlement, the entity re-measures the obligation (and the related plan assets, if any) using current actuarial assumptions (including current market interest rates and other current market prices).

When it is virtually certain that another party will reimburse some or all of the expenditure required to settle a defined benefit obligation, the right to reimbursement is recognised as a separate asset. The asset is measured at fair value. In all other respects, the asset is treated in the same way as plan assets. In surplus or deficit, the expense relating to a defined benefit plan is presented as the net of the amount recognised for a reimbursement.

Actuarial assumptions

Actuarial assumptions are unbiased and mutually compatible.

Financial assumptions are based on market expectations, at the reporting date, for the period over which the obligations are to be settled.

The rate used to discount post-employment benefit obligations (both funded and unfunded) reflect the time value of money. The currency and term of the financial instrument selected to reflect the time value of money is consistent with the currency and estimated term of the post-employment benefit obligations.

Post-employment benefit obligations are measured on a basis that reflects:

2.15 Employee benefits (continued)

- estimated future salary increases;
- the benefits set out in the terms of the plan (or resulting from any constructive obligation that goes beyond those terms) at the reporting date; and
- estimated future changes in the level of any state benefits that affect the benefits payable under a defined benefit plan, if, and only if, either:
  - those changes were enacted before the reporting date; or
  - past history, or other reliable evidence, indicates that those state benefits will change in some predictable manner, for example, in line with future changes in general price levels or general salary levels.

Assumptions about medical costs take account of estimated future changes in the cost of medical services, resulting from both inflation and specific changes in medical costs.

2.16 Provisions and contingencies

Provisions are recognised when:
- the entity has a present obligation as a result of a past event;
- it is probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation; and
- a reliable estimate can be made of the obligation.

The amount of a provision is the best estimate of the expenditure expected to be required to settle the present obligation at the reporting date.

Where the effect of the time value of money is material, the amount of a provision is the present value of the expenditures expected to be required to settle the obligation.

The discount rate is a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability.

Where some or all of the expenditure required to settle a provision is expected to be reimbursed by another party, the reimbursement is recognised when, and only when, it is virtually certain that reimbursement will be received if the entity settles the obligation. The reimbursement is treated as a separate asset. The amount recognised for the reimbursement does not exceed the amount of the provision.

Provisions are reviewed at each reporting date and adjusted to reflect the current best estimate. Provisions are reversed if it is no longer probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation.

Where discounting is used, the carrying amount of a provision increases in each period to reflect the passage of time. This increase is recognised as an interest expense. A provision is used only for expenditures for which the provision was originally recognised.

Provisions are not recognised for future operating surplus (deficits).

If the entity has a contract that is onerous, the present obligation (net of recoveries) under the contract is recognised and measured as a provision.

A constructive obligation to restructure arises only when the entity:
- has a detailed formal plan for the restructuring, identifying at least:
  - the activity/operating unit or part of an activity/operating unit concerned;
  - the principal locations affected;
  - the location, function, and approximate number of employees who will be compensated for services being terminated;
  - the expenditures that will be undertaken; and
  - when the plan will be implemented; and
- has raised a valid expectation in those affected that it will carry out the restructuring by starting to implement that plan or announcing its main features to those affected by it.

A restructuring provision includes only the direct expenditures arising from the restructuring, which are those that are both:
- necessarily entailed by the restructuring; and
- not associated with the ongoing activities of the entity.

ACCOUNTING POLICIES

2.16 Provisions and contingencies (continued)

No obligation arises as a consequence of the sale or transfer of an operation until the entity is committed to the sale or transfer, that is, there is a binding arrangement.

After their initial recognition contingent liabilities recognised in entity combinations that are recognised separately are subsequently measured at the higher of:

- the amount that would be recognised as a provision; and
- the amount initially recognised less cumulative amortisation.

Contingent assets and contingent liabilities are not recognised. Contingencies are disclosed in note 32 - Contingencies.

2.17 Commitments

Items are classified as commitments when the entity has committed itself to future transactions that will normally result in the outflow of cash.

Disclosures are required in respect of unrecognised contractual commitments which include future capital commitments relating to property, plant and equipment, investment property, intangible assets and heritage assets, as applicable, operational commitments, as well as future commitments relating to operating leases. Refer to note 31 - Commitments.

Commitments for which disclosure is necessary to achieve a fair presentation should be disclosed in a note to the financial statements, if both the following criteria are met:

- contracts should be non-cancellable or only cancellable at significant cost (for example, contracts for computer or building maintenance services); and
- contracts should relate to something other than the routine, steady, state business of the entity – therefore salary commitments relating to employment contracts or social security benefit commitments are excluded.

2.18 Revenue from exchange transactions

Revenue is the gross inflow of economic benefits or service potential during the reporting period when those inflows result in an increase in net assets, other than increases relating to contributions from owners.

An exchange transaction is one in which the entity receives assets or services, or has liabilities extinguished, and directly gives approximately equal value (primarily in the form of goods, services or use of assets) to the other party in exchange.

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction.

Measurement

Revenue is measured at the fair value of the consideration received or receivable, net of trade discounts and volume rebates.

Sale of goods

Revenue from the sale of goods is recognised when all the following conditions have been satisfied:

- the entity has transferred to the purchaser the significant risks and rewards of ownership of the goods;
- the entity retains neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods sold;
- the amount of revenue can be measured reliably;
- it is probable that the economic benefits or service potential associated with the transaction will flow to the entity; and
- the costs incurred or to be incurred in respect of the transaction can be measured reliably.

Rendering of services

When the outcome of a transaction involving the rendering of services can be estimated reliably, revenue associated with the transaction is recognised by reference to the stage of completion of the transaction at the reporting date. The outcome of a transaction can be estimated reliably when all the following conditions are satisfied:

- the amount of revenue can be measured reliably;
- it is probable that the economic benefits or service potential associated with the transaction will flow to the entity;
- the stage of completion of the transaction at the reporting date can be measured reliably; and
- the costs incurred for the transaction and the costs to complete the transaction can be measured reliably.

ACCOUNTING POLICIES

2.18 Revenue from exchange transactions (continued)

When services are performed by an indeterminate number of acts over a specified time frame, revenue is recognised on a straight-line basis over the specified time frame unless there is evidence that some other method better represents the stage of completion. When a specific act is much more significant than any other acts, the recognition of revenue is postponed until the significant act is executed.

When the outcome of the transaction involving the rendering of services cannot be estimated reliably, revenue is recognised only to the extent of the expenses recognised that are recoverable.

Service revenue is recognised by reference to the stage of completion of the transaction at the reporting date. Stage of completion is determined by services performed to date as a percentage of total services to be performed.

Interest

Revenue arising from the use by others of entity assets yielding interest or similar distributions is recognised when:

- it is probable that the economic benefits or service potential associated with the transaction will flow to the entity; and
- the amount of the revenue can be measured reliably.

Interest is recognised, in surplus or deficit, using the effective interest rate method.

Service fees included in the price of the product are recognised as revenue over the period during which the service is performed.

2.19 Revenue from non-exchange transactions

Revenue comprises gross inflows of economic benefits or service potential received and receivable by the entity, which represents an increase in net assets, other than increases relating to contributions from owners.

Conditions on transferred assets are stipulations that specify that the future economic benefits or service potential embodied in the asset are required to be consumed by the recipient as specified or future economic benefits or service potential must be returned to the transferor.

Control of an asset arise when the entity can use or otherwise benefit from the asset in pursuit of its objectives and can exclude or otherwise regulate the access of others to that benefit.

Exchange transactions are transactions in which one entity receives assets or services, or has liabilities extinguished, and directly gives approximately equal value (primarily in the form of cash, goods, services, or use of assets) to another entity in exchange.

Non-exchange transactions are transactions that are not exchange transactions. In a non-exchange transaction, an entity either receives value from another party without directly giving approximately equal value in exchange, or gives value to another party without directly receiving approximately equal value in exchange.

Restrictions on transferred assets are stipulations that limit or direct the purposes for which a transferred asset may be used, but do not specify that future economic benefits or service potential is required to be returned to the transferor if not deployed as specified.

Stipulations on transferred assets are terms in laws or regulation, or a binding arrangement, imposed upon the use of a transferred asset by entities external to the reporting entity.

Transfers are inflows of future economic benefits or service potential from non-exchange transactions, other than taxes.

Recognition

An inflow of resources from a non-exchange transaction recognised as an asset is recognised as revenue, except to the extent that a liability is also recognised in respect of the same inflow.

As the entity satisfies a present obligation recognised as a liability in respect of an inflow of resources from a non-exchange transaction recognised as an asset, it reduces the carrying amount of the liability recognised and recognises an amount of revenue equal to that reduction.

ACCOUNTING POLICIES

2.19 Revenue from non-exchange transactions (continued)

Measurement

Revenue from a non-exchange transaction is measured at the amount of the increase in net assets recognised by the entity.

When, as a result of a non-exchange transaction, the entity recognises an asset, it also recognises revenue equivalent to the amount of the asset measured at its fair value as at the date of acquisition, unless it is also required to recognise a liability. Where a liability is required to be recognised it will be measured as the best estimate of the amount required to settle the obligation at the reporting date, and the amount of the increase in net assets, if any, recognised as revenue. When a liability is subsequently reduced, because the taxable event occurs or a condition is satisfied, the amount of the reduction in the liability is recognised as revenue.

Transfers

The entity recognises an asset in respect of transfers when the transferred resources meet the definition of an asset and satisfy the criteria for recognition as an asset.

Transferred assets are measured at their fair value as at the date of acquisition.

Debt forgiveness and assumption of liabilities

The entity recognises revenue in respect of debt forgiveness when the former debt no longer meets the definition of a liability or satisfies the criteria for recognition as a liability, provided that the debt forgiveness does not satisfy the definition of a contribution from owners.

Revenue arising from debt forgiveness is measured at the carrying amount of debt forgiven.

Gifts and donations, including goods in-kind

Gifts and donations, including goods in-kind, are recognised as assets and revenue when it is probable that the future economic benefits or service potential will flow to the entity and the fair value of the assets can be measured reliably.

Services in-kind

The entity recognises services in-kind that are significant to its operations and/or service delivery objectives as assets and recognise the related revenue when it is probable that the future economic benefits or service potential will flow to the entity and the fair value of the assets can be measured reliably.

Where services in-kind are not significant to the entity's operations and/or service delivery objectives and/or do not satisfy the criteria for recognition, the entity discloses the nature and type of services in-kind received during the reporting period.

2.20 Investment income

Investment income is recognised on a time-proportion basis using the effective interest method.

2.21 Borrowing costs

Borrowing costs are interest and other expenses incurred by the entity in connection with the borrowing of funds.

Borrowing costs are recognised as an expense in the period in which they are incurred.

2.22 Translation of foreign currencies

Foreign currency transactions

A foreign currency transaction is recorded, on initial recognition in Rands, by applying to the foreign currency amount the spot exchange rate between the functional currency and the foreign currency at the date of the transaction.

At each reporting date:

- foreign currency monetary items are translated using the closing rate;
- non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rate at the date of the transaction; and
- non-monetary items that are measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined.

ACCOUNTING POLICIES

2.22 Translation of foreign currencies (continued)

Exchange differences arising on the settlement of monetary items or on translating monetary items at rates different from those at which they were translated on initial recognition during the period or in previous annual financial statements are recognised in surplus or deficit in the period in which they arise.

When a gain or loss on a non-monetary item is recognised directly in net assets, any exchange component of that gain or loss is recognised directly in net assets. When a gain or loss on a non-monetary item is recognised in surplus or deficit, any exchange component of that gain or loss is recognised in surplus or deficit.

Cash flows arising from transactions in a foreign currency are recorded in Rands by applying to the foreign currency amount the exchange rate between the Rand and the foreign currency at the date of the cash flow.

2.23 Comparative figures

Where necessary, comparative figures have been reclassified to conform to changes in presentation in the current year.

2.24 Fruitless and wasteful expenditure

Fruitless and wasteful expenditure means expenditure which was made in vain and could have been avoided had reasonable care been exercised.

All expenditure relating to fruitless and wasteful expenditure is recognised as an expense in the statement of financial performance in the year that the expenditure was incurred. The expenditure is classified in accordance with the nature of the expense, and where recovered, it is subsequently accounted for as revenue in the statement of financial performance.

2.25 Irregular expenditure

Irregular expenditure as defined in section 1 of the PFMA is expenditure other than unauthorised expenditure, incurred in contravention of or that is not in accordance with a requirement of any applicable legislation, including -

(a) this Act; or
(b) the State Tender Board Act, 1968 (Act No. 86 of 1968), or any regulations made in terms of the Act; or
(c) any provincial legislation providing for procurement procedures in that provincial government.

National Treasury practice note no. 4 of 2008/2009 which was issued in terms of sections 76(1) to 76(4) of the PFMA requires the following (effective from 1 April 2008):

Irregular expenditure that was incurred and identified during the current financial and which was condoned before year end and/or before finalisation of the financial statements must also be recorded appropriately in the irregular expenditure register. In such an instance, no further action is required with the exception of updating the note to the financial statements.

Irregular expenditure that was incurred and identified during the current financial year and for which condonement is being awaited at year end must be recorded in the irregular expenditure register. No further action is required with the exception of updating the note to the financial statements. Where irregular expenditure was incurred in the previous financial year and is only condoned in the following financial year, the register and the disclosure note to the financial statements are updated with the amount condoned.

Irregular expenditure that was incurred and identified during the current financial year and which was not condoned by the National Treasury or the relevant authority must be recorded appropriately in the irregular expenditure register. If liability for the irregular expenditure can be attributed to a person, a debt account must be created if such a person is liable in law. Immediate steps must thereafter be taken to recover the amount from the person concerned. If recovery is not possible, the accounting officer or accounting authority may write off the amount as debt impairment and disclose such in the relevant note to the financial statements. The irregular expenditure register must also be updated accordingly. If the irregular expenditure has not been condoned and no person is liable in law, the expenditure related thereto must remain against the relevant programme/expenditure item, be disclosed as such in the note to the financial statements and updated accordingly in the irregular expenditure register.

*** See Note 34**

ACCOUNTING POLICIES

2.26 Research and development expenditure

Expenditure on research is recognised as an expense when it is incurred.

An asset arising from development is recognised when:

- it is technically feasible to complete the asset so that it will be available for use or sale.
- there is an intention to complete and use or sell it.
- there is an ability to use or sell it.
- it will generate probable future economic benefits or service potential.
- there are available technical, financial and other resources to complete the development and to use or sell the asset.
- the expenditure attributable to the asset during its development can be measured reliably.

2.27 Budget information

The entity is typically subject to budgetary limits in the form of appropriations or budget authorisations (or equivalent), which is given effect through authorising legislation, appropriation or similar.

General purpose financial reporting by the entity provides information on whether resources were obtained and used in accordance with the legally adopted budget.

The approved budget covers the fiscal period from 4/1/2019 to 3/31/2020.

The annual financial statements and the budget are on the same basis of accounting therefore a comparison with the budgeted amounts for the reporting period have been included in the Statement of comparison of budget and actual amounts.

2.28 Related parties

The entity operates in an economic sector currently dominated by entities directly or indirectly owned by the South African Government. As a consequence of the constitutional independence of the three spheres of government in South Africa, only entities within the national sphere of government are considered to be related parties. Significant influence is the power to participate in the financial and operating policy decisions of an entity, but is not control over those policies.

Management are those persons responsible for planning, directing and controlling the activities of the entity, including those charged with the governance of the entity in accordance with legislation, in instances where they are required to perform such functions.

Close members of the family of a person are those family members who may be expected to influence, or be influenced by that person in their dealings with the entity.

2.29 Events after reporting date

Events after reporting date are those events, both favourable and unfavourable, that occur between the reporting date and the date when the financial statements are authorised for issue. Two types of events can be identified:

- those that provide evidence of conditions that existed at the reporting date (adjusting events after the reporting date); and
- those that are indicative of conditions that arose after the reporting date (non-adjusting events after the reporting date).

The entity adjusts the amount recognised in the financial statements to reflect adjusting events after the reporting date once the event occurred.

The entity discloses the nature of the event and an estimate of its financial effect or a statement that such estimate cannot be made in respect of all material non-adjusting events, where non-disclosure could influence the economic decisions of users taken on the basis of the financial statements (see note 38).

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

3. New standards and interpretations

3.1 Standards and interpretations effective and adopted in the current year

In the current year, the entity has adopted the following standards and interpretations that are effective for the current financial year and that are relevant to its operations:

GRAP 109: Accounting by Principals and Agents

The objective of this Standard is to outline principles to be used by an entity to assess whether it is party to a principal-agent arrangement, and whether it is a principal or an agent in undertaking transactions in terms of such an arrangement. The Standard does not introduce new recognition or measurement requirements for revenue, expenses, assets and/or liabilities that result from principal-agent arrangements. The Standard does however provide guidance on whether revenue, expenses, assets and/or liabilities should be recognised by an agent or a principal, as well as prescribe what information should be disclosed when an entity is a principal or an agent.

It furthermore covers Definitions, Identifying whether an entity is a principal or agent, Accounting by a principal or agent, Presentation, Disclosure, Transitional provisions and Effective date.

The effective date of the standard is not yet set by the Minister of Finance.

The entity will adopt the standard for the first time when the Minister sets the effective date for the standard.

The impact of the standard is not material.

GRAP 108: Statutory Receivables

The objective of this Standard is: to prescribe accounting requirements for the recognition, measurement, presentation and disclosure of statutory receivables.

It furthermore covers: Definitions, recognition, derecognition, measurement, presentation and disclosure, transitional provisions, as well as the effective date.

The date of the standard is for years beginning on or after April 1, 2019.

The entity early adopted the standard for the first time in the 2018/2019 annual financial statements.

The impact of the standard is not material.

GRAP 20: Related parties

The objective of this standard is to ensure that a reporting entity's annual financial statements contain the disclosures necessary to draw attention to the possibility that its financial position and surplus or deficit may have been affected by the existence of related parties and by transactions and outstanding balances with such parties.

An entity that prepares and presents financial statements under the accrual basis of accounting (in this standard referred to as the reporting entity) shall apply this standard in:

- identifying related party relationships and transactions;
- identifying outstanding balances, including commitments, between an entity and its related parties;
- identifying the circumstances in which disclosure of the items in (a) and (b) is required; and
- determining the disclosures to be made about those items.

This standard requires disclosure of related party relationships, transactions and outstanding balances, including commitments, in the consolidated and separate financial statements of the reporting entity in accordance with the Standard of GRAP on Consolidated and Separate Financial Statements. This standard also applies to individual annual financial statements.

Disclosure of related party transactions, outstanding balances, including commitments, and relationships with related parties may affect users' assessments of the financial position and performance of the reporting entity and its ability to deliver agreed services, including assessments of the risks and opportunities facing the entity. This disclosure also ensures that the reporting entity is transparent about its dealings with related parties.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

3. New standards and interpretations (continued)

The standard states that a related party is a person or an entity with the ability to control or jointly control the other party, or exercise significant influence over the other party, or vice versa, or an entity that is subject to common control, or joint control. As a minimum, the following are regarded as related parties of the reporting entity:

- A person or a close member of that person's family is related to the reporting entity if that person:
  - has control or joint control over the reporting entity;
  - has significant influence over the reporting entity;
  - is a member of the management of the entity or its controlling entity.
- An entity is related to the reporting entity if any of the following conditions apply:
  - the entity is a member of the same economic entity (which means that each controlling entity, controlled entity and fellow controlled entity is related to the others);
  - one entity is an associate or joint venture of the other entity (or an associate or joint venture of a member of an economic entity of which the other entity is a member);
  - both entities are joint ventures of the same third party;
  - one entity is a joint venture of a third entity and the other entity is an associate of the third entity;
  - the entity is a post-employment benefit plan for the benefit of employees of either the entity or an entity related to the entity. If the reporting entity is itself such a plan, the sponsoring employers are related to the entity;
  - the entity is controlled or jointly controlled by a person identified in (a); and
  - a person identified in (a)(i) has significant influence over that entity or is a member of the management of that entity (or its controlling entity).

The standard furthermore states that related party transaction is a transfer of resources, services or obligations between the reporting entity and a related party, regardless of whether a price is charged.

The standard elaborates on the definitions and identification of:

- Close member of the family of a person;
- Management;
- Related parties;
- Remuneration; and
- Significant influence

The standard sets out the requirements, inter alia, for the disclosure of:

- Control;
- Related party transactions; and
- Remuneration of management

The effective date of the standard is for years beginning on or after April 1, 2019.
The entity has adopted the standard for the first time in the 2019/2020 annual financial statements.

The impact of the standard is not material.

3.2 Standards and interpretations issued, but not yet effective

The entity has not applied the following standards and interpretations, which have been published and are mandatory for the entity's accounting periods beginning on or after April 1, 2020 or later periods:

GRAP 104 (amended): Financial instruments

The revisions to the Standard of GRAP on Financial instruments are to better align the Standards of GRAP with recent international developments. The amendments will result in better information available to make decisions about financial assets and their recoverability, and more transparent information on financial liabilities.

The most significant changes to the Standard affect:

- financial guarantee contracts issued;
- loan commitments issued;
- classification of financial assets;
- amortised cost of financial assets;
- impairment of financial assets; and
- disclosures.

The effective date of the amendment is not yet set by the Minister of Finance.

*** See Note 34**

3. New standards and interpretations (continued)

The entity expects to adopt the amendment for the first time when the Minister sets the effective date.

It is unlikely that the standard will have a material impact on the entity's annual financial statements.

Guideline: Guideline on the application of materiality to financial statements

The objective of the Guideline is to provide guidance that will assist entities to apply the concept of materiality when preparing financial statements in accordance with Standards of GRAP. The Guideline aims to assist entities in achieving the overall financial reporting objective. The Guideline outlines a process that may be considered by entities when applying materiality to the preparation of financial statements.

The guideline is encouraged to be used by entities.

The entity expects to adopt the guideline for the first time in the 2020/21 annual financial statements.

It is unlikely that the standard will have a material impact on the entity's annual financial statements.

GRAP 1 (amended): Presentation of financial statements

Amendments to this Standard of GRAP, are primarily drawn from the IASB's amendments to the IFRS on Presentation of financial statements.

Summary of amendments are:

Materiality and aggregation

The amendments clarify that:

- information should not be obscured by aggregating or by providing immaterial information;
- materiality considerations apply to all parts of the financial statements; and
- even when a Standard of GRAP requires a specific disclosure, materiality considerations apply.

Statement of financial position and statement of financial performance

The amendments clarify that the list of line items to be presented in these statements can be disaggregated and aggregated as relevant and additional guidance on subtotals in these statements.

Notes structure

The amendments add examples of possible ways of ordering the notes to clarify that understandability and comparability should be considered when determining the order of the notes and to demonstrate that the notes need not be presented in the order listed in the Standard.

Disclosure of accounting policies

Remove guidance and examples with regards to the identification of significant accounting policies that were perceived as being potentially unhelpful.

An entity applies judgement based on past experience and current facts and circumstances.

The effective date of this amendment is for years beginning on or after April 1, 2020.
The entity expects to adopt the amendment for the first time in the 2020/21 annual financial statements.

The adoption of this amendment has not had a material impact on the results of the entity, but has resulted in more disclosure than would have previously been provided in the annual financial statements.

IGRAP 20: Accounting for adjustments to revenue

Adjustments to revenue already recognised in terms of legislation or similar means arise from the completion of an internal review process within entities, and/or the outcome of an external appeal or objection process undertaken in

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

3. New standards and interpretations (continued)

terms of legislation or similar means. Adjustments to revenue include any refunds that become payable as a result of the completion of a review, appeal or objection process. The adjustments to revenue already recognised following the outcome of a review, appeal or objection process can either result in a change in an accounting estimate, or a correction of an error.

As per the scope, this Interpretation clarifies the accounting for adjustments to exchange and non-exchange revenue charged in terms of legislation or similar means, and interest and penalties that arise from revenue already recognised as a result of the completion of a review, appeal or objection process. Changes to the measurement of receivables and payables, other than those changes arising from applying this Interpretation, are dealt with in accordance with the applicable Standards of GRAP. The principles in this Interpretation may be applied, by analogy, to the accounting for adjustments to exchange or non-exchange revenue that arises from contractual arrangements where the fact patterns are similar to those in the Interpretation.

The Interpretation sets out the issues and relating consensus with accounting for adjustments to revenue.

The effective date of the interpretation is for years beginning on or after April 1, 2020.

The entity expects to adopt the interpretation for the first time in the 2020/21 annual financial statements.

It is unlikely that the standard will have a material impact on the entity's annual financial statements.

4. Inventories

Raw materials and finished goods*	3,099,478	4,710,077
Consumables**	39,620	70,160
Other - Commercial***	519,109	844,169
	3,658,207	**5,624,406**

***Stock components for repair and maintenance.**
****Consumables stationery**
*****Commercial component**

Inventory write down for the year	8,332	248,661

5. Receivables from exchange transactions

Trade receivables	5,363,774	6,979,381
Sundry receivables	2,881,659	6,451,983
Impairment of receivables	(1,342,984)	(2,277,483)
	6,902,449	**11,153,881**

Interest is charged on invoices over 60 days outstanding in the accounts receivable age analysis. Trade receivables are stated at amortised cost using the effective interest rate method less impairment of receivables.

*** See Note 34**

Figures in Rand	2020	2019 Restated*

5. Receivables from exchange transactions (continued)

SAWS therefore recognises impairment of receivables from regulated and non-regulated transactions on individual and collective assessment as follows:

	Current - 90 Days	91-120 Days	Over 120 Days	Total
Regulated/Statutory Commercial Debtors	7,853,395	47,591	9,227,586	17,128,572
Eskom Group	-	-	1,752	1,752
Insurance clients	27,280	11,511	420,617	459,408
Others	124,916	4,276	752,632	881,824
	8,005,591	**63,378**	**10,402,587**	**18,471,556**

Trade and other receivables transactions past due but not impaired

Receivables from exchange transactions which are less than 3 months past due are not automatically considered to be impaired. Management's judgement is used to impair amounts, as at March 31, 2020, R 2,684,588 (2019: R 797,860) were past due but not impaired. Trade receivables amounting to R 1,312,562 (2019: R 1 500 077) are neither past due nor impaired and are considered fully recoverable.

Trade and other receivables impaired

As of March 31, 2020, trade and other receivables of R 1,342,984 (2019: R 2,277,483) were impaired and provided for.

Reconciliation of provision for impairment of receivables from exchange transactions

	2020	2019 Restated*
Opening balance	2,277,483	1,042,444
Provision for impairment	1,342,984	2,809,723
Bad debts written off as uncollectible	(961,336)	-
Unused amounts reversed	(1,316,147)	(1,574,684)
	1,342,984	**2,277,483**

The maximum exposure to credit risk at the reporting date is the carrying amount of each class of trade receivables mentioned above. The entity does not hold any collateral as security. Trade receivables are individually and collectively assessed for impairment, whether significant or not, and are included within the group of trade receivables with similar credit risk characteristics.

6. Statutory receivables

	2020	2019 Restated*
Statutory receivables	28,086,180	18,216,221
Impairment of receivables	(17,128,573)	(6,013,108)
	10,957,608	**12,203,113**

In terms of the SAWS Act, the entity provides meteorological services to the airline industry at a rate promulgated by the Minister of Environment, Forestry and Fisheries in the Government Gazette. The Regulating Committee on Meteorological Services facilitates the consultative process between the entity and the Aviation industry for the recommendation of the tariff to the Minister.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

6. Statutory receivables (continued)

SAWS charges interest on all accounts overdue at a rate determined by the Minister of Finance in the Government Gazette. During the year under review, the interest rate charged varied between 9,75% and 10,25% on all overdue accounts. Statutory receivables are stated at amortised cost using the effective interest rate method less impairment of receivables. Statutory receivables amounting to R 4,037,908 (2019: R 825 793) are neither past due nor impaired and are considered to be fully recoverable.

Statutory receivables are assessed for impairment on a monthly basis individually. Management's judgement is used to impair amounts that are past due. At 31 March 2020, statutory receivables of R 5,236,506 (2019: R 562 763) were past due but not impaired.

Statutory receivables impaired

As of March 31, 2020, receivables from non-exchange transactions of R 17,128,573 (2019: R 6,013,108) were impaired and provided for. The bulk of this provision, R 8,860,927 relates to SAA, Comair and South African Express which are undergoing business rescue. Refer to note 38 for detailed information.

Reconciliation of provision for impairment of statutory receivables

Opening balance	6,013,108	2,827,371
Provision for impairment	17,128,573	3,185,737
Bad debts written off as uncollectible	(836,250)	-
Unused amounts reversed	(5,176,859)	-
	17,128,572	**6,013,108**

7. Prepayments

Prepaid expenses	6,284,107	7,733,560

Prepaid expenses comprise services paid in advance, license fees, subscription fees and staff travel advance payments.

8. Cash and cash equivalents

Cash and cash equivalents consist of:

Bank balances	32,086,790	32,094,893
Short-term deposits	12,449,117	28,596,328
	44,535,907	**60,691,221**

Due to lower collections from Debtors, the cash of R 33 m which should have been ring-fenced for conditional grants was used for operational purposes. Now with the situation in the aviation industry, a request will be sent to the Department to condone the usage of this conditional grant for being used for operations.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand

9. Investment property

	2020			2019		
	COST / VALUATION	ACCUMULATED DEPRECIATION AND ACCUMULATED IMPAIRMENT	CARRYING VALUE	COST / VALUATION	ACCUMULATED DEPRECIATION AND ACCUMULATED IMPAIRMENT	CARRYING VALUE
Investment property	71,779,121	-	71,779,121	69,277,188	-	69,277,188

Reconciliation of investment property - 2020

	OPENING BALANCE	FAIR VALUE ADJUSTMENTS	TOTAL
Investment property	69,277,188	2,501,933	71,779,121

Reconciliation of investment property - 2019

	OPENING BALANCE	FAIR VALUE ADJUSTMENTS	TOTAL
Investment property	67,487,940	1,789,248	69,277,188

The investment property (Land) includes portions 411, portion of portion 412 and portion 423 (which are portions of the remaining extent of portion 407) of the farm Garsfontein 374, Registration Division JR, Gauteng. The property is 37,1116 ha, located in the west of N1 National Freeway and immediately north of Rigel Avenue (South) in the Waterkloof Heights suburb of Pretoria.

The property was valued at 31 March 2020 by The Property Partnership CC (Chartered Surveyors & Valuers) Registration Number CK 1987/025962/23, a qualified independent professional valuer. The Property Partnership CC is not connected to the entity and has recent experience in location and category of the investment property.

The valuer used the market data valuation approach, whereby similar properties' valuations are used as a motivation to value the property, which is an acceptable method to determine the value of this type of property. If the property was stated on the historical cost basis, the amounts would be as follows:

Historical cost - Investment property:	26,890,000	26,890,000

Valuations were made on the basis of open-market value. The property was brought to book in 2003. The valuation from independent valuers was accepted to reflect the fair value at 31 March 2002 for comparative purposes.

Figures in Rand

10. Property, plant and equipment

	2020			2019		
	COST / VALUATION	ACCUMULATED DEPRECIATION AND ACCUMULATED IMPAIRMENT	CARRYING VALUE	COST / VALUATION	ACCUMULATED DEPRECIATION AND ACCUMULATED IMPAIRMENT	CARRYING VALUE
Aircraft - airframes	861,362	(861,362)	-	1,588,249	(861,362)	726,887
Aircraft - engines	-	-	-	1,771,965	-	1,771,965
Aircraft - propellers	177,911	(177,911)	-	184,999	(177,911)	7,088
Air quality equipment	35,222,761	(15,925,307)	19,297,454	31,853,599	(13,879,064)	17,974,535
Buildings - Irene and Bethlehem	6,285,402	(334,937)	5,950,465	4,770,831	(222,403)	4,548,428
Computer Equipment & Servers	158,563,173	(69,842,723)	88,720,450	135,875,125	(59,474,072)	76,401,053
Fence	3,623,985	(2,183,310)	1,440,675	2,784,993	(1,974,964)	810,029
Furniture and fixtures	11,829,778	(6,522,105)	5,307,673	10,340,475	(5,964,831)	4,375,644
Land - Garsfontein	7,316,265	-	7,316,265	12,421,912	-	12,421,912
Leasehold improvements	4,243,759	(2,482,351)	1,761,408	3,235,524	(2,383,391)	852,133
Library books and equipment	55,820	(39,626)	16,194	51,149	(36,686)	14,463
Meteorological equipment	72,322,941	(55,383,750)	16,939,191	68,935,871	(52,270,548)	16,665,323
Motor vehicles	600,817	(369,012)	231,805	600,817	(353,716)	247,101
Office equipment	4,798,745	(2,820,462)	1,978,283	4,586,220	(2,552,684)	2,033,536
Radar - equipment	266,179,561	(98,231,089)	167,948,472	266,179,561	(89,706,035)	176,473,526
Tools and other equipment	6,494,131	(2,716,613)	3,777,518	6,419,001	(2,229,606)	4,189,395
Total	**578,576,411**	**(257,890,558)**	**320,685,853**	**551,600,291**	**(232,087,273)**	**319,513,018**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand

10. Property, plant and equipment (continued)

Reconciliation of property, plant and equipment - 2020

	OPENING BALANCE	ADDITIONS	REVALUATIONS	DEPRECIATION	IMPAIRMENT LOSS	TOTAL
Aircraft - airframes	726,887	-	-	-	(726,887)	-
Aircraft - engines	1,771,965	-	-	-	(1,771,965)	-
Aircraft - propellers	7,088	-	-	-	(7,088)	-
Air quality equipment	17,974,535	3,369,162	-	(2,046,244)	-	19,297,453
Buildings - Irene and Bethlehem	4,548,428	-	1,514,571	(112,534)	-	5,950,465
Computer Equipment & Servers	76,401,053	22,694,817	-	(10,375,420)	-	88,720,450
Fence	810,029	838,992	-	(208,346)	-	1,440,675
Furniture and fixtures	4,375,644	1,489,285	-	(557,274)	-	5,307,655
Land - Garsfontein	12,421,912	-	(5,105,647)	-	-	7,316,265
Leasehold improvements	852,133	1,008,235	-	(98,960)	-	1,761,408
Library books and equipment	14,463	4,671	-	(2,940)	-	16,194
Motor vehicles	247,101	-	-	(15,296)	-	231,805
Meteorological equipment	16,666,324	3,386,069	-	(3,113,202)	-	16,939,191
Office equipment	2,033,536	212,525	-	(267,778)	-	1,978,283
Radar - equipment	176,473,526	-	-	(8,525,054)	-	167,948,472
Tools and other equipment	4,189,395	75,129	-	(487,006)	-	3,777,518
	319,514,019	**33,078,885**	**(3,591,076)**	**(25,810,054)**	**(2,505,940)**	**320,685,834**

Figures in Rand

10. Property, plant and equipment (continued)

Reconciliation of property, plant and equipment - 2019

	OPENING BALANCE	ADDITIONS	SUM OF CHANGE IN ESTIMATES (CARRYING AMOUNTS RESTATEMENTS)	DISPOSALS	SUM OF DISPOSED ACCUMULATED DEPRECIATION - 2019	REVALUATIONS	DEPRECIATION	IMPAIRMENT LOSS	TOTAL
Aircraft - airframes	759,607	-	-	(70,879)	116,505	-	(78,346)	-	726,887
Aircraft - engines	2,037,760	-	-	(265,795)	-	-	-	-	1,771,965
Aircraft - propellers	20,673	-	-	(11,813)	-	-	(1,772)	-	7,088
Air quality equipment	18,916,810	1,558,579	-	(298,062)	35,658	-	(2,183,720)	(54,730)	17,974,535
Buildings - Irene and Bethlehem	3,666,881	-	-	-	-	922,764	(36,254)	(4,963)	4,548,428
Computer Equipment & Servers	77,953,458	9,124,895	2,504,329	(8,454,612)	2,300,587	-	(6,730,077)	(297,527)	76,401,053
Fence	951,638	9,950	-	-	-	-	(151,559)	-	810,029
Furniture and fixtures	1,820,410	2,684,651	404,939	(500,952)	471,038	-	(459,706)	(44,736)	4,375,644
Land - Garsfontein	9,699,780	-	-	-	-	2,722,132	-	-	12,421,912
Leasehold improvements	332,393	596,780	12,659	(39,890)	39,194	-	(50,414)	(38,589)	852,133
Library Books & Equipment	18,748	-	-	-	-	-	(3,125)	(1,160)	14,463
Motor vehicles	271,807	-	21,954	(383,419)	383,419	-	(46,660)	-	247,101
Meteorological equipment	13,654,125	4,633,936	1,173,300	(25,916)	25,403	-	(2,788,923)	(6,602)	16,665,323
Office equipment	2,176,870	752,262	38,581	(1,335,513)	761,776	-	(294,857)	(65,583)	2,033,536
Radar - equipment	188,555,937	1,099,722	-	(10,344,114)	5,709,838	-	(8,547,857)	-	176,473,526
Tools and other equipment	527,451	3,943,904	132,572	(13,039)	12,954	-	(413,405)	(1,042)	4,189,395
	321,364,348	**24,404,679**	**4,288,334**	**(21,744,004)**	**9,856,372**	**3,644,896**	**(21,786,675)**	**(514,932)**	**319,513,018**

Figures in Rand	2020	2019 Restated*

10. Property, plant and equipment (continued)

Depreciation rates

No depreciation was recognised for aircraft engines in the current financial year as there were no flight hours. Depreciation is based on the hours flown.

Revaluations

Reconciliation of surplus or (loss) recognised in the revaluation reserve in the statement of changes in net assets:

Land and building - revaluation	**2020**	**2019**
Land - Garsforntein and Irene	(5,105,647)	2,722,132
Building - Irene and Bethlehem	1,514,571	922,764
Aircraft Propellers	(7,088)	-
Aircraft Airframe	(726,887)	-
Aircraft Engine	(1,685,347)	-
	(6,010,398)	**3,644,896**

Details of properties

Bethlehem Property (Building)

Cost	600,000	600,000
Accumulated depreciation	(216,000)	(204,000)
	384,000	**396,000**

The Bethlehem property was revalued at 31 March 2020 by an independent valuer in terms of the provisions of the Property Valuations Professional Act, 2000 (No. 47 of 2000). Valuations were made on the basis of open-market value. The revaluation surplus was credited to the non-distributable reserve.

The property includes Erf 1997, valued at R 1,144,000, and Erf 2064, valued at R 1,008,000, in the town of Bethlehem in the Free State province. Erf 1997, also known as 8 Dr Clark Street, Bethlehem, has an area of 1,997 square meters and includes a house and buildings.

Erf 2064, also known as 19 Gordon Dreyer Street, Bethlehem, has an area of 1,568 square meters and includes a house and outbuildings. The title deed of the Bethlehem property was not registered in the name of the entity at financial year end, however, the Minister of Public Works passed all rights, obligations and liabilities to the entity on the commencement of the SAWS Act, 2001 (No. 8 of 2001).

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

10. Property, plant and equipment (continued)

Irene Property

The entity utilises Portion 110 of the farm Doornkloof 391 JR for scientific purposes for no consideration, which was fair valued at R 2,181,820 for the land and R 3,882,000 for the buildings on 31 March 2020. Improvements on the property consist of two interconnected offices, workshop, storage wings and some outbuildings and carports. In accordance with the registration of ownership the property may not be transferred to the entity. Valuations were made on the basis of open market value.

The property was valued at 31 March 2020 by The Property Partnership CC (Chartered Surveyors& Valuers) Registration Number CK 1987/025962/23, a qualified independent professional valuer. The Property Partnership CC is not connected to the entity and has recent experience in location and category of the investment property.

There were no contractual commitments for the acquisition of property, plant and equipment entered into by the entity at the reporting date. The entity does not have assets pledged as security.

Land - Garsforntein

The Land includes portion 412 and portion 423 (which are portions of the remaining extent of portion 407) of the farm Garsfontein 374, Registration Division JR, Gauteng. The property is 11.4759 ha, located in the west of N1 National Freeway and immediately north of Rigel Avenue (South) in the Waterkloof Heights suburb of Pretoria.

The property was valued at R 5,134,445 as at 31 March 2020 by The Property Partnership CC (Chartered Surveyors & Valuers) Registration Number CK 1987/025962/23, a qualified independent professional valuer. The Property Partnership CC is not connected to the entity and has recent experience in location and category of the investment property.

The valuer used the market data valuation approach, whereby similar properties' valuations are used as a motivation to value the property, which is an acceptable method to determine the value of this type of property.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand

11. Intangible assets

	2020			2019		
	COST / VALUATION	ACCUMULATED DEPRECIATION AND ACCUMULATED IMPAIRMENT	CARRYING VALUE	COST / VALUATION	ACCUMULATED DEPRECIATION AND ACCUMULATED IMPAIRMENT	CARRYING VALUE
Computer software	36,006,810	(27,486,580)	8,520,230	41,778,246	(24,710,952)	17,067,294
Servitude	1,500,000	(415,206)	1,084,794	1,500,000	(295,203)	1,144,797
Work-in-progress - Computer Software	-	-	-	2,499,154	-	2,499,154
Total	**37,506,810**	**(27,901,786)**	**9,605,024**	**45,777,400**	**(25,006,155)**	**20,711,245**

Reconciliation of intangible assets - 2020

	OPENING BALANCE	ADDITIONS	REVALUATIONS	DEPRECIATION	IMPAIRMENT LOSS	TOTAL
Computer software	17,067,296	3,683,278	2,499,154	(2,775,629)	(11,953,870)	8,520,229
Servitude	1,144,794	-	-	(60,000)	-	1,084,794
Work-in-progress - Computer Software	2,499,154	-	(2,499,154)	-	-	-
	20,711,244	**3,683,278**	**-**	**(2,835,629)**	**(11,953,870)**	**9,605,023**

Figures in Rand

11. Intangible assets (continued)

Reconciliation of intangible assets - 2019

	OPENING BALANCE	ADDITIONS	SUM OF CHANGE IN ESTIMATES (CARRYING AMOUNTS RESTATEMENTS)	AMORTISATION	IMPAIRMENT LOSS	TOTAL
Computer software	15,825,943	451,319	2,681,547	(1,886,495)	(5,018)	17,067,296
Servitude	1,204,794	-	-	(60,000)	-	1,144,794
Work-in-progress - Computer Software	-	2,499,154	-	-	-	2,499,154
	17,030,737	**2,950,473**	**2,681,547**	**(1,946,495)**	**(5,018)**	**20,711,244**

Other information

Intangible assets comprise computer software (including website costs) and a servitude. The entity acquired the right of use of land for its meteorological equipment for an indefinite period of time from AP Beckely in Bloemfontein. The servitude is amortised over the useful life of the meteorological equipment installed on the land.

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

12. Operating lease liability

Operating Lease Liability - Current Liabilities	(1,336,230)	(2,759,322)

The following lease payments are related to operating leases for the rental of premises, office equipment and motor vehicles:

The entity leases 10 premises (2019: 10 premises) from various lessors. The rental agreements for the premises include escalation clauses between 5.5% and 10% per year in rental payments. The duration of the rentals varies between two and ten years. The entity has an agreement with Dihlabeng Municipality which stipulates that the entity will offer free rental to the municipality in exchange for the entity incurring no levies and electricity costs on the same. As a result of this arrangement the entity incurs no levies and electricity cost on the property and no rental income accrues, thus no financial impact on the annual financial statements.

The entity entered into a lease agreement for the rental of furniture and fittings with D&F Commodity Broking CC for a total amount of R 608 810.00 for four (4) years (13 November 2019 to 14 November 2023).

SAWS signed a contract for the rental of motor vehicles with Kempston Trading (Pty) Ltd for a total amount of R 22,015,278 for three (3) years effective 1 June 2018.

2020	FURNITURE AND FITTINGS	PREMISES	MOTOR VEHICLES	TOTAL
Future minimum lease payments not later than 1 year	152,203	20,214,971	7,338,426	27,705,600
Later than 1 year and not later than 5 years	393,190	44,765,826	1,223,071	46,382,087
Later than 5 years	-	4,214,233	-	4,214,233
	545,393	**69,195,030**	**8,561,497**	**78,301,920**

2019	PREMISES	MOTOR VEHICLE	TOTAL
Future minimum lease payments not later than 1 year	17,448,001	7,338,426	24,786,427
Later than 1 year and not later than 5 years	54,375,210	8,561,497	62,936,707
Later than 5 years	5,284,747	-	5,284,747
	77,107,958	**15,899,923**	**93,007,881**

Straight lining effect on operating lease liability:		
Opening balance	2,759,322	3,834,076
Deferred rental	(1,423,092)	(1,074,754)
	1,336,230	**2,759,322**

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

13. Payables from exchange transactions

Trade and Sundry Payables	21,350,243	20,096,736
Payroll Payables	11,359,835	9,362,058
Creditor bursary students	552,675	1,573,722
Staff subsidies and travel	230,090	182,206
	33,492,843	**31,214,722**

Trade and other payables are subsequently carried at amortised cost.

Spot rates at period-end		
USD	17.8752	14.4649
EUR	19.6951	16.2273
GBP	22.1169	18.8418
CHF	18.7069	14.4191
	-	-

Unrealised foreign exchange gains and losses are calculated using the spot rate at year-end.

Included in trade and other payables are foreign creditors	Currency	2020 Foreign currency	2019 Foreign currency	2020 R	2019 R
UK Met Office	GBP	607	-	53,700	-
World Meteorological Organisation	CHF	45 823.12	-	857,209	-
Microsoft Ireland Operations	USD	75 899.63	-	1,356,721	-
World Meteorological Organisation	USD	7 231.86	-	129,487	-
Interoute	GBP		11,526	-	217,171
Envitech Ltd	USD		74,015	-	1,070,842
		-	-	**2,397,117**	**1,288,013**

14. Employee benefit obligations

Defined benefit plan

Post retirement medical aid plan

All eligible employees of the entity, who joined the entity before 1 November 2008, excluding those that accepted the settlement offer in September 2011, receive a 100% subsidy of medical aid scheme contributions in retirement, provided that the employee belonged to a registered medical scheme before leaving the entity on grounds of retirement, including early retirement and retirement due to ill-health and death. The subsidy is subject to a maximum cap amount. The Rand cap amount for 2020 is R 3 030.60 (2019: R 2 776.94), irrespective of the number of dependants. The Rand cap is expected to increase with health care cost inflation each year.

During the financial year, the number of employees eligible to receive post-employment medical aid subsidies from the entity was as follows:

*** See Note 34**

Figures in Rand	2020	2019 Restated*

14. Employee benefit obligations (continued)

	2020	2019
Current (In service) employees	17	19
Continuation members (Pensioners)	32	31
	49	**50**

The actuarial valuation of the liability in respect of the post-employment medical aid benefit is performed on Statement of Financial Position date as summarised below. The 2020 valuation has been performed by an independent company of Actuaries, Momentum Consultants and Actuaries, registration number 2002/027693/07.

This is an actuarial valuation based on economic assumptions as performed by Momentum. These assumptions have resulted in a decrease in in the present value of the liability due to subsidy payments expected. Assumption for net discount rate used for 219/20 compared to prior is 4.10% (Prior year: 2.32%). The return on Plan Asset is 12.95% compared to 9.65% in the prior year. In conclusion, these rates have resulted in a decrease in the liability.

	2020	2019 Restated*
Plan asset		
Return on plan asset	1,429,000	1,506,000
Employer contribution	549,000	198,000
Actuarial gains	(1,655,000)	(3,073,000)
	323,000	**(1,369,000)**
Accrued liability		
Current service cost	284,000	367,000
Interest cost	1,814,000	1,929,000
Actuarial gains	(3,470,000)	(4,403,000)
	(1,372,000)	**(2,107,000)**
Movement in the defined benefit obligation		
Balance 01 April	19,303,000	22,391,713
Current service cost	284,000	367,000
Interest cost	1,814,000	1,929,000
Actuarial gains	(3,470,000)	(4,403,000)
Benefit paid	(1,012,000)	(1,061,000)
	16,919,000	**19,223,713**
Changes in the fair value of plan assets are as follows:		
Opening balance	15,100,685	17,530,685
Expected return	1,429,000	1,506,000
Actuarial gains	(1,655,000)	(3,073,000)
Contributions by employer	549,000	198,000
Benefits paid	(1,145,685)	(1,061,000)
	14,278,000	**15,100,685**
Summary of employee benefit obligation		
Defined benefit obligation	16,919,000	19,229,649
Fair value of plan asset	(14,278,000)	(15,100,685)
	2,641,000	**4,128,964**

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

14. Employee benefit obligations (continued)

Amounts recognised in the statement of financial performance:		
Current service costs	284,000	367,000
Interest costs	1,814,000	1,929,000
Expected return on plan assets	1,429,000	1,506,000
Actuarial gain	(1,681,000)	(1,330,000)
	1,846,000	**2,472,000**

The entity expects to contribute R 3 992 000 to its defined benefit plans in the following financial year.

Key assumptions used

Assumptions used at the reporting date:

Discount rates used	12.95 %	9.65 %
Expected rate of return on assets	7.00 %	5.66 %
Medical aid cost trend rates	8.50 %	7.16 %
Expected increase in salaries	100.00 %	100.00 %
Normal retirement age	65	65
Proportion of employees married at the retirement	90.00 %	90.00 %

The expected return on plan asset is based on the market expectations at the beginning of the period, for the returns over the entire life of the related obligation.

The two most important variables are the discount and medical aid inflation rates.

Other assumptions

Assumed healthcare cost trends rates have a significant effect on the amounts recognised in surplus or deficit. A one percentage point change in assumed healthcare cost trends rates would have the following effects:

	One percentage point increase	One percentage point decrease
Effect on the aggregate of the service cost and interest cost	-	-
Employer's accrued liability	15,364,000	18,764,000
Employer's service cost	88,000	129,000
Employer's interest cost	2,062,000	2,173,000
Employer's accrued liability	18,764,000	15,367,000
Employer's service cost	106,000	86,000
Employer's interest cost	2,354,000	1,915,000

*** See Note 34**

Figures in Rand	2020	2019 Restated*

14. Employee benefit obligations (continued)

Amounts for the current and previous four years are as follows:

	2020	2019	2018	2017	2016
Defined benefit obligation	16,920,000	19,223,713	22,391,713	28,822,000	25,844,713
Plan asset	(14,279,000)	(15,100,685)	(17,530,685)	(17,501,685)	(17,540,239)
	2,641,000	**4,123,028**	**4,861,028**	**11,320,315**	**8,304,474**

The employee benefit obligation is partially funded by the plan assets.

Defined contribution plan

It is the policy of SAWS to provide retirement benefits to all its employees. A defined contribution provident fund exists, all of which is subject to the Pensions Fund Act.

The entity is under no obligation to cover any unfunded benefits.

Included in the defined contribution plan information, is a Multi-Employer Funds which is a Defined Benefit Plan.

Short-term employee benefit

Leave pay accrual		
Opening balance	5,334,974	4,717,707
Leave raised	5,453,953	3,751,398
Leave utilised	(3,812,221)	(3,134,131)
	6,976,706	**5,334,974**

15. Unspent conditional grants and receipts

Unspent conditional grants and receipts comprises of:		
Unspent public contributions and donations	16,709,292	15,955,833
Movement during the year		
Balance at the beginning of the year	15,955,833	12,019,918
Additions during the year	4,470,645	9,269,150
Income recognised during the year	(3,719,586)	(5,333,235)
	16,706,892	**15,955,833**

Donor funds consist of funding received from various institutions. Memoranda of Understanding (MoUs) are entered into between the entity and the donors with the aim of utilising the entity's expertise in meteorology.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

16. Provisions

Reconciliation of provisions - 2020

	OPENING BALANCE	ADDITIONS	UTILISED DURING THE YEAR	REVERSED DURING THE YEAR	TOTAL
Bonus provision: current	8,058,746	-	-	(8,058,746)	-
Capped leave provision: non-current	489,234	28,947	(155,268)	-	362,913
	8,547,980	**28,947**	**(155,268)**	**(8,058,746)**	**362,913**

Reconciliation of provisions - 2019

	OPENING BALANCE	ADDITIONS	UTILISED DURING THE YEAR	TOTAL
Bonus provision: current	15,500,000	-	(7,441,254)	8,058,746
Capped leave provision: non-current	457,491	39,067	(7,324)	489,234
	15,957,491	**39,067**	**(7,448,578)**	**8,547,980**

Non-current liabilities	362,913	489,234
Current liabilities	-	8,058,746
	362,913	**8,547,980**

Provision for Performance Bonus

Performance bonuses are payable at the discretion of the Board. These will not be paid in the 2019/20 as per Board Resolution hence no provision has been made for the current financial year.

Capped Leave Provision

Capped leave is calculated based on the working days due to each employee, as at 31 July 2001 from the payroll system. Adjustments to this provision relate to increases in salary rates, days claimed or paid out through retirement or death.

17. Unspent government grant - Capex

Breakdown of Unspent Government Grant - Conditional Grant CAPEX

Opening Balance	27,516,777	-
Government grant - capital expenditure	93,515,000	37,030,000
Income recognition during the year - capital expenditure	(36,762,163)	-
Income recognition during the year - conditional grant	(30,103,186)	(9,513,223)
	54,166,428	**27,516,777**

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*
18. Revenue from exchange transactions		
Commercial revenue		
Aviation	128,494,477	128,234,129
Aviation instruments maintenance income	1,084,680	797,307
Air quality revenue	844,055	5,891,089
Information fees	21,706,314	17,647,286
Training Regional Training Centre	897,362	880,653
Lightning Detection Network Sales	6,432,599	5,751,552
Selling of instruments	4,708,030	1,406,665
	164,167,517	**160,608,681**
Other revenue		
Miscellaneous income	(126,217)	1,175,813
Delinquency fees	1,324,186	53,941
	1,197,969	**1,229,754**
19. Investment revenue		
Interest revenue		
Bank	3,714,215	4,592,966
20. Government grants and subsidies		
Operating grants		
Government grants	204,074,000	199,975,000
Capital grants		
Government grants	55,281,163	9,513,223
Early Warning Capital Grant	11,590,434	-
	66,871,597	**9,513,223**
	270,945,597	**209,488,223**
21. Public contributions and donations		
TETA SETA Grants	1,070,893	1,511,125
Donor funds - Other	3,719,586	5,333,236
	4,790,479	**6,844,361**

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*
22. Employee related costs		
Salaries and wages	225,613,126	207,065,387
Performance bonus and leave pay	3,933,386	7,940,664
Medical aid contributions	16,157,531	14,315,906
Unemployment Insurance Fund	868,279	836,701
Compensation commissioner	444,011	840,330
Post retirement medical aid	15,146,964	15,937,046
Overtime and shift allowance	15,384,730	14,399,470
	277,548,027	**261,335,504**
23. Administrative expenditure		
Admin fees	1,111,657	1,312,258
Audit Expenses (Internal)	1,137,629	1,163,322
Sales promotions	-	2,600
Public awareness	13,619	56,745
Selling and Marketing	-	27,562
Commission paid	15,685	24,651
Board expenses	1,718,700	1,025,370
Conference Costs	625,233	584,457
Refreshments	166,412	266,995
Entertainment	365,045	389,989
Entrance Fees	2,933	4,570
Legal Fees	2,200,619	888,543
Printing and stationary	602,063	1,443,010
Training	1,355,351	4,065,337
Bank Charges	257,186	302,606
	9,572,132	**11,558,015**
24. Depreciation and amortisation		
Property, plant and equipment	25,810,053	21,786,601
Intangible assets	2,835,629	1,946,152
	28,645,682	**23,732,753**
25. Finance costs		
Other interest paid - SARS	-	953,196
26. Impairment of Receivables		
Contributions to impairment provision	10,186,006	4,878,144

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*
27. General expenses		
Cleaning	1,199,331	1,741,396
Conferences and seminars	810,822	3,049,171
Consultants	6,580,547	7,965,610
Consumables spares	21,485,515	12,761,267
Electricity	5,905,359	4,760,148
Entertainment	-	1,117
Aircraft expenses	434,931	232,337
Leases and rentals	30,178,858	27,173,459
Repairs and maintenance	13,885,297	9,770,590
Audit fees (External)	4,971,708	3,113,092
Computer and software licences	23,942,069	16,685,267
Insurance	2,248,033	1,849,639
Levies	2,453,986	2,180,673
Motor vehicle leases	2,216,065	2,583,827
Provision Adjustment	(8,058,746)	-
Placement fees	3,993,212	3,316,910
Postage and courier	1,131,902	409,343
Publications	523,753	426,611
Promotions and sponsorships	2,531,567	4,244,675
Security	3,087,091	2,831,390
Subscriptions and membership fees	1,233,322	4,157,930
Communication costs	18,771,524	13,834,687
Training	130,955	-
Travel and Accommodation	14,862,643	19,669,538
Venue expenses	81,073	-
	154,600,817	**142,758,677**
28. Fair value adjustments		
Investment property	2,501,933	1,789,248
29. Impairment of assets		
Impairments		
Property, plant and equipment and Intangible Assets	12,040,488	519,953

During the current financial year, the entity reviewed its Property, Plant and Equipment in order to assess whether there was any indication that the assets suffered any impairment loss. The entity`s aircraft was found to have a carrying value above it`s recoverable amount, therefore it was impaired. The impairment loss was written off against the revaluation reserve as disclosed in the Statement of Changes in Net Assets.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*
30. Cash used in operations		
(Deficit)/Surplus	(46,715,798)	(71,034,312)
Adjustments for:		
Depreciation and amortisation	28,645,682	23,732,753
Loss on sale of assets and liabilities	-	10,173,331
Profit/loss on foreign exchange	1,249,168	1,256,634
Fair value adjustments	(2,501,933)	(1,789,248)
Impairment deficit	12,040,488	519,953
Debt impairment	4,157,960	(8,058,746)
Bad debts written off	1,807,484	-
Movements in operating lease assets and accruals	(1,423,092)	(1,074,754)
Movements in retirement benefit assets and liabilities	(7,061,867)	(1,031,705)
Movements in provisions	(8,185,067)	617,492
Changes in working capital:		
Inventories	1,966,199	(2,149,313)
Receivables from exchange transactions	4,251,432	(1,765,579)
Statutory receivables	1,245,506	5,617,055
Prepayments	1,449,453	1,499,873
Payables from exchange transactions	2,278,124	(655,003)
Unspent conditional grants and receipts	753,459	3,935,915
	(6,042,802)	**(40,205,654)**

31. Commitments

This committed expenditure relates to various contracts and outstanding purchase orders that the entity entered into and will be financed by available bank facilities and retained surpluses. These are all operational in nature.

The entity erred in the previous year by insufficiently disclosing commitments to the value of R 5,846,092. The prior year balance of R 155,440,788 was consequentially adjusted.

Commitments

- within one year	84,744,457	83,334,151
- in second to fifth year inclusive	30,709,379	77,952,729
	115,453,836	**161,286,880**

32. Contingencies

The table below sets out the contingent liabilities at year end with the maximum potential liability to the entity:

Contingent liabilities	3,413,060	-

*** See Note 34**

Figures in Rand	2020	2019 Restated*

32. Contingencies (continued)

- The plaintiff, a former SAWS employee is suing SAWS for unfair dismissal and breach of contract for an amount of R 3,413,060.
- A case was lodged at the High Court, by an applicant disputing the appointment of a candidate in a post, claiming that the candidate did not meet the minimum requirements as stipulated in the job advert. The applicant is requesting to be appointed in such a position. The costs of the outcome at this stage cannot be determined.
- A service provider took the entity to the High Court where they are challenging the entity`s procurement process on an awarded bid and the estimated cost is unknown at this stage. The applicant has since removed the matter from the roll.

33. Related parties

Relationships

In preparing the Annual Financial Statements for the year ended 31 March 2020, The entity has identified the related party relations and made the necessary disclosures in the Annual Financial Statements. The entity is deemed to be under common control with all the entities in the national sphere of government and therefore these entities are considered to be related parties.

Entity structure

SAWS was established in terms of the national legislation as one of the government's essential scientific institutions providing information and services that have a direct impact on the lives of citizens and their properties and contributing greatly to sustainable development in South Africa. The entity reports functionally to the Department of Environment, Forestry and Fisheries Affairs and therefore the Minister of Environment, Forestry and Fisheries is the Executive Authority. The entity is governed by the Board as appointed by the Minister. The details of the Board members are disclosed below. SAWS receive donor funds from the Department of Science and Innovation and The Water Research Council for the financing of some research projects.

SAWS provides weather and climate related services to various entities in national government. This includes provision of services and instruments to public entities.

SAWS further provides aviation services to the national carrier which is controlled by the national government. These services are provided on a cost recovery basis. The transaction amounts are included either in the Statement of Financial Performance as revenue from exchange transactions and related account balances in the Statement of Financial Position as trade and other receivables from exchange transactions or in the respective Notes.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

33. Related parties (continued)

Apart from transactions listed in the previous paragraph, SAWS undertakes the following transactions with other entities in the public sector:

- PAYE, UIF, SDL and other payroll taxes are collected by the entity and remitted to the revenue authority on a monthly basis;
- Basic services such as electricity, water and sanitation by local municipalities;
- Air travel as supplied by the national carrier which is controlled by national government;
- Post-retirement benefits to former employees of the entity by the Government Pension Fund;
- The collection of aviation and other related services revenue from entities controlled by national government; and
- The provision of air quality equipment to municipalities.

The transaction amounts for the above services are included either in the Statement of Financial Performance as expenditure and related account balances in the Statement of Financial Position as trade and other payables or the respective Notes.

The following related party transactions occurred during the financial year:

Revenue related		
Government grant and subsidies	222,593,000	199,975,000
Capital expenditure grant	93,515,000	37,029,996
	316,108,000	**237,004,996**

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand

33. Related parties (continued)

Remuneration of management

2020

NAME	DESIGNATION	BASIC SALARY	OTHER SHORTTERM EMPLOYEE BENEFITS (CASH ALLOWANCE)	MEDICAL AID, UIF & PENSION	ACTING ALLOWANCE	CELLPHONE ALLOWANCE	OTHER BENEFITS RECEIVED (MOTOR ALLOWANCE)	TOTAL
Mr Lengoasa J*	Chief Executive Officer	1,121,400	663,495	85,443	-	21,000	-	1,891,338
Ms Shongwe B**	Chief Financial Officer	1,174,844	471,352	84,897	-	27,000	97,102	1,855,195
Ms Mphafudi J	Executive Corporate and Regulatory Services	1,048,199	473,425	83,849	-	36,000	146,760	1,788,233
Mr Ndabambi MF***	Executive Infrastructure and Information Systems And Acting Chief Executive Officer	1,135,704	334,346	155,459	169,147	36,000	124,087	1,954,743
Dr Mphepya J***	Executive Infrastructure and Weather and Climate Services and Acting Chief Executive Officer	1,140,000	508,919	87,285	176,415	36,000	120,000	2,068,619
Mr Ngobeni T##	Acting Executive Weather and Climate Services	-	-	-	153,463	-	-	153,463
Mr Terblanche D****	Acting Executive Infrastructure and Information Systems	-	-	-	61,127	-	-	61,127
Mr Gumenge L#	Acting Chief Financial Officer	-	-	-	75,749	-	-	75,749
Mr Kekana T###	Acting Executive Corporate and Regulatory Services	-	-	-	33,875	-	-	33,875
		5,620,147	**2,451,537**	**496,933**	**669,776**	**156,000**	**487,949**	**9,882,342**

* Resigned in September 2019.
** Resigned in December 2019.
*** Each acted for a period of six (6) months during the current financial year following the resignation of Mr. J Lengoasa.
**** Resigned on 30 June 2019.
# Acted as CFO for a period of three and half (3.5) months following the resignation of Ms Shongwe.
Acted as an Executive for a period of five (5) months during the current financial year.
Acted as an Executive for CRS for one (1) month during the current financial year.

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

33. Related parties (continued)

2019

NAME	DESIGNATION	BASIC SALARY	BONUSES AND PERFORMANCE RELATED PAYMENTS	MEDICAL AID, UIF & PENSION	CELLPHONE ALLOWANCE	TOTAL
Mr Lengoasa J	Chief Executive Officer	3,059,820	-	284,975	36,000	3,380,795
Ms Shongwe B	Chief Financial Officer	1,945,003	-	297,797	36,000	2,278,800
Ms Mphafudi J	Executive Corporate and Regulatory Services	1,637,005	-	157,842	36,000	1,830,847
Mr Ndabambi MF	Executive Infrastructure and Information Systems	1,758,514	70,732	289,200	36,000	2,154,446
Mr Ngobeni T	Acting Executive Weather and Climate Services	121,314	-	-	-	121,314
Mr Terblanche D	Acting Executive Infrastructure and Information Systems	141,689	-	-	-	141,689
Mr Witi J	Acting Executive Weather and Climate Services	107,000	-	-	-	107,000
		8,770,345	**70,732**	**1,029,814**	**144,000**	**10,014,891**

Management class: Non-executive management

2020

NAME	DESIGNATION	FEES	TRAVEL	OTHER BENEFITS RECEIVED	TOTAL
Ms Magomola N	Board Chairperson	322,965	29,056	47,072	399,093
Mr Ndadana T*	Independent Member of the ARC	23,328	-	-	23,328
Dr Dexter PD	Deputy Chairperson	133,365	64,675	-	198,040
Adv Block D	Non-Executive Member	116,640	19,158	-	135,798
Mr Labane G**	Independant Member of the ARC	86,476	7,776	-	94,252
Mr Lefutso D	Non-Executive Member	128,304	21,312	-	149,616
Dr Maila M#	Non-Executive Member	-	-	-	-
Mr Maharaj S***	Independant Member of the ARC	54,432	7,776	-	62,208
Ms Mudly-Padayachie S	Non-Executive Member	97,686	16,038	-	113,724
Ms Moroka-Mosia KS	Non-Executive Member	144,828	29,609	-	174,437
Mr Phaduli I	Non-Executive Member	242,028	4,068	-	246,096
Ms Renqe F	Non-Executive Member	117,612	608	3,888	122,108
		1,467,664	**200,076**	**50,960**	**1,718,700**

* **Appointed on 1 November 2019.**

** **Appointed on 26 February 2019.**

*** **Appointed on 26 February 2019.**

\# **Dr N Maila works for Government and thus was not remunerated. Independent Members of the ARC are not members of the Board.**

*** See Note 34**

Figures in Rand	2020	2019 Restated*

33. Related parties (continued)

2019

NAME	DESIGNATION	FEES	TRAVEL	TOTAL
Ms Magomola N	Chairperson	286,772	74,056	360,828
Ms Ngomezulu M	Former Chairperson	124,860	23,457	148,317
Dr Dexter PD	Deputy Chairperson	87,415	36,151	123,566
Adv Block D	Non-Executive Member	157,662	41,087	198,749
Mr Lefutso D	Non-Executive Member	164,427	42,916	207,343
Ms Madiba ND	Former Non-Executive Member	27,214	8,252	35,466
Dr Maila M	Non-Executive Member	-	-	-
Prof Mokotong E	Non-Executive Member	103,592	23,478	127,070
Ms Mudly-Padayachie S	Non-Executive Member	140,366	27,494	167,860
Mr Nicholls R	Non-Executive Member	-	-	-
Mr Phaduli I	Non-Executive Member	19,440	946	20,386
Ms Renqe F	Non-Executive Member	11,664	1,923	13,587
		1,123,412	**279,760**	**1,403,172**

34. Prior-year adjustments

Presented below are those items contained in the statement of financial position, statement of financial performance and cash flow statement that have been affected by prior-year adjustments:

Statement of financial position

2019

	Note	AS PREVIOUSLY REPORTED	CORRECTION OF ERROR	RESTATED
Receivables from exchange transactions		10,897,279	256,602	11,153,881
Property, plant and equipment		361,293,969	(41,780,951)	319,513,018
Intangible assets		28,897,515	(8,186,270)	20,711,245
Payables from exchange transactions		(30,119,532)	(1,095,190)	(31,214,722)
Employee benefit obligation		(4,123,025)	(5,953)	(4,128,978)
Revaluation reserve		(56,863,789)	(186,662)	(57,050,451)
Accumulated (surplus)/deficit opening balance		(474,359,445)	48,926,460	(425,432,985)
Accumulated (surplus)/deficit		68,962,360	2,071,964	71,034,324
		(95,414,668)	**-**	**(95,414,668)**

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

34. Prior-year adjustments (continued)

Statement of financial performance

2019

	Note	AS PREVIOUSLY REPORTED	CORRECTION OF ERROR	RE-CLASSIFICATION	RESTATED
Administrative expenses		16,436,159	-	(4,878,144)	11,558,015
Depreciation and amortisation		32,755,614	(9,022,861)	-	23,732,753
Impairment of receivables		-	-	4,878,144	4,878,144
General expenses		141,827,101	931,576	-	142,758,677
(Gain)/loss on disposal of assets and liabilities		360,933	9,812,400	-	10,173,333
Inventory losses/write-downs/reversal of inventory write-downs		169,114	350,849	-	519,963
Surplus for the year		**191,548,921**	**2,071,964**	**-**	**193,620,885**

Cash flow statement

2019

	Note	AS PREVIOUSLY REPORTED	RE-CLASSIFICATION	RESTATED
Cash flow from operating activities – Suppliers		(151,586,853)	(2,331,958)	(153,918,811)
Cash flow from operating activities – Purchase of intangible assets	11	(5,282,431)	2,331,958	(2,950,473)

Errors

The following prior period errors adjustments occurred:

Error 1

Accumulated surplus (opening balance adjustment)	48,926,460
Revaluation Reserve	(186,662)
Property, Plant and Equipment	(41,780,951)
Intangible Assets	(8,186,270)
Receivables from exchange transactions	256,602
Payables from exchange transactions	(1,095,190)
Employee Benefit Obligation	(5,953)
General Expenses	931,576
Depreciation and Amortisation	(9,022,861)
Loss on disposal of assets	9,812,400
Impairment loss	350,849
	-

*** See Note 34**

Figures in Rand	2020	2019 Restated*

34. Prior-year adjustments (continued)

During the year the entity appointed a service provider to assist with the reconstruction of the asset register. The above restatements of the property, plant and equipment, intangible assets, revaluation reserve, depreciation and amortisation, general expenditure, impairment loss, accumulated surplus and loss on disposal of assets are due to the updating of the fixed asset register. The adjustments were as a result of correcting an error to the prior year disclosure to the effect of performing the re-assessment of useful lives. Additionally the PPE was adjusted for items erroneously omitted in the prior year due to error in formulas in the 2019 Fixed Asset Register.

The adjustments to receivables from exchange transactions relates to the accrual of March 2019 interest which was not accrued for in the prior year.

The adjustments to payables from exchange transactions relates to employee costs (employee insurance and salary expenses) which were erroneously not recorded in the prior year.

The adjustment to the employee benefit obligation relates to reclassification from accumulated surplus which was incorrectly expensed in the prior year.

The entity erred in the prior year by under disclosing commitments with R5,846,092 and the correction is detailed in note 31.

35. Risk management

Financial risk management

The entity's activities expose it to a variety of financial risks: market risk (including currency risk, fair value interest rate risk, cash flow interest rate risk and price risk), credit risk and liquidity risk.

Liquidity risk

Prudent liquidity risk management implies maintaining sufficient cash and marketable securities, the availability of funding through an adequate amount of committed credit facilities and the ability to close out market positions. Due to the dynamic nature of the underlying businesses, entity treasury maintains flexibility in funding by maintaining availability under committed credit lines.

The entity's risk to liquidity is a result of the funds available to cover future commitments. The entity manages liquidity risk through an ongoing review of future commitments and credit facilities.

Cash flow forecasts are prepared and adequate utilised borrowing facilities are monitored. Prudent liquidity risk management implies maintaining sufficient cash and obtaining the continued commitment from the Department of Environment, Forestry and Fisheries for the government grant and the collection of aviation income from respective airlines. Due to the nature of the business, management maintains flexibility in funding by maintaining expenses below budget and continuously pursuing additional income via donor funding, information fees and the sale of lightning detection networks.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

35. Risk management (continued)

The table below analyses the entity's financial liabilities into relevant maturity groupings based on the remaining period at the statement of financial position to the contractual maturity date. The amounts disclosed in the table are the contractual undiscounted cash flows. Balances due within 12 months equal their carrying balances as the impact of discounting is not significant.

	Less than 1 year
2020 Trade and other payables	33,492,843
2019 Trade and other payables	31,214,722

Credit risk

Financial assets, which potentially subject the entity to the risk

Credit risk consists mainly of cash deposits, cash equivalents, derivative financial instruments and trade debtors. The entity only deposits cash with major banks with high quality credit standing and limits exposure to any one counter-party. Trade receivables comprise a widespread customer base. Management evaluated credit risk relating to customers on an ongoing basis. If customers are independently rated, these ratings are used. Otherwise, if there is no independent rating, risk control assesses the credit quality of the customer, taking into account its financial position, past experience and other factors. Individual risk limits are set based on internal or external ratings in accordance with limits set by the board. The utilisation of credit limits is regularly monitored. Sales to retail customers are settled in cash or using major credit cards. Credit guarantee insurance is purchased when deemed appropriate.

Financial assets exposed to credit risk at year end were as follows:

Financial instrument	2020	2019
Cash and cash equivalents	44,535,907	60,691,221
Receivables from exchange transactions (excluding statutory receivables)	6,902,449	11,153,881

Market risk

Interest rate risk

The entity's exposure to market risk (in the form of interest rates risk) arises primarily form the entity's investment in cash and cash equivalents, accounts receivable and payable. The entity manages its interest rate risk by obtaining competitive rates from approved financial institutions on a monthly basis. The entity policy is to manage interest rate risk so that fluctuations in variable rates do not have a material impact on surplus/ (deficit).

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

35. Risk management (continued)

The entity's exposure to interest rate risk and the effective interest rates on financial instruments at the Statement of Financial Position date is as follows:

	2020 Effective interest rate	2020	2019
Cash	6.50 %	44,535,907	60,691,221
Accounts receivable	10.00 %	24,144,163	31,090,554
		68,680,070	**91,781,775**

	2020 Effective interest rate	2020	2019
Financial assets	8.25 %	68,680,070	91,781,775
Financial liabilities	- %	(33,492,843)	(31,214,722)
	8.25 %	**35,187,227**	**60,567,053**

Average rate/Total Net Financial Assets

Foreign Currency Risk

The entity does not operate internationally but undertakes certain transactions denominated in foreign currencies, and is exposed to foreign exchange risk arising from fluctuations in foreign currencies. The entity does not hedge against its exposure to foreign exchange risk. Exposure to foreign currency exposure at financial year-end relates to trade payables and is disclosed under Note 13.

	2020 foreign currency	2019 foreign currency	2020 R	2019 R
CHF Payables	45,823	-	857,209	-
GBP Payables	607	11,526	53,700	217,171
USD Payables	83,131	74,015	1,486,208	1,070,842
	-	**-**	**2,397,117**	**1,288,013**

36. Fruitless and wasteful expenditure

Opening balance as previously reported	1,059,304	106,108
Opening balance as restated	**1,059,304**	**106,108**
Add: Expenditure identified - current (Travel)	32,203	953,196
Add: Expenditure identified - current (Car Storage Fees)	5,850	-
Closing balance	**1,097,357**	**1,059,304**

The fruitless and wasteful expenditure for the year ending 31 March 2020 relates to travel that was cancelled without following the cancellation rules from the travel agent for R 32 203 and R 5 850 relates to one of SAWS' vehicles having been taken for repairs and not being collected timeously, which resulted in SAWS having to pay a storage fee for the vehicle.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

36. Fruitless and wasteful expenditure (continued)

The fruitless and wasteful expenditure for the year ending 31 March 2019 relates to late payment of tax to the South African Revenue Service.

No investigation was carried in the current financial year on fruitless and wasteful expenditure; however, the Acting Chief Executive Officer is in the process of initiating the necessary investigation and corrective action will be taken.

In relation to the irregular expenditure incurred on a cancelled trip, an investigation was carried out and the legal division has been requested to recover the funds from the concerned individual who has since resigned.

37. Irregular expenditure

Opening balance as previously reported*	42,394,171	4,786,184
Opening balance as restated	**42,394,171**	**4,786,184**
Expenditure incurred in excess of budget	12,791,976	20,012,029
Professional fees paid - No prior written approval for deviation	-	2,421,615
Process used to appoint recruitment agents was not in line with procurement process	1,850,645	-
Process followed to appoint employees deemed improper	1,284,697	2,552,347
Renewal of IT infrastructure contract without following procurement process	14,760,000	-
Lease agreement for Head Office in contravention of procurement process	14,638,908	12,449,005
Incorrect criteria used to appoint a supplier	-	172,991
Extension of contract for PABX and telephone system without following procurement process	210,900	-
Use of a company to screen new employees without following procurement process	38,797	-
Renewal of lease in Springbok without following procurement process	101,395	-
Renewal of security service contract in Cape Town at the Radar sites without following procurement process	30,000	-
Purchase of IT equipment without necessary approval	5,779	-
Renewal of lease contract in Cape Town without necessary approval	97,094	-
Approval not made in terms of the delegation of authority (Helium gas and rental cylinders)	46,570	-
Award of contract to procure gift cards for employee awards without following procurement process	29,411	-
Hiring of mobile air-conditioning unit without following procurement process	28,350	-
Closing balance	**88,308,693**	**42,394,171**

Management is in the process of initiating investigations into the above-mentioned irregular expenditure and will apply consequence management where applicable. Some of the mentioned irregularities incurred are currently under investigation by forensic auditors.

*** See Note 34**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand

37. Irregular expenditure (continued)

Incidents/cases identified in the current year include those listed below:

	Disciplinary steps taken/criminal proceedings		
Expenditure incurred in excess of budget	The matter will be investigated.	12,791,976	-
Process used to appoint recruitment agents was not in line with procurement process	A forensic and disciplinary hearing was concluded and the employee has since resigned. Management is awaiting legal advice on how to proceed further with the matter.	1,850,645	-
Process followed to appoint employees deemed improper	This consists of two matters, where the first matter will be investigated and the second matter is part of court proceedings at the High Court and will be updated upon its finalisation.	1,284,697	-
Renew of IT infrastructure contract without following procurement process	A forensic investigation was concluded and management is in the process of concluding the matter.	14,760,000	-
Lease agreement for Head Office in contravention of procurement process	The matter will be investigated.	14,638,908	-
Extension of contract for PABX and telephone system without following procurement process	Process for investigation has been initiated by management.	210,900	-
Use of a company to screen new employees without following procurement process	Process for investigation has been initiated by management.	38,797	-
Renewal of lease in Springbok without following procurement process	Process for investigation has been initiated by management.	101,395	-
Renewal of security service contract in Cape Town at the Radar sites without following procurement process	Process for investigation has been initiated by management.	30,000	-
Purchase of IT equipment without necessary approval	Process for investigation has been initiated by management.	5,779	-
Renewal of lease contract in Cape Town without necessary approval	Process for investigation has been initiated by management.	97,094	-
Approval not made in terms of the delegation of authority (Helium gas and rental cylinders)	The matter will be investigated.	46,570	-
Award of contract to procure gift cards for employee awards without following procurement process	The matter will be investigated.	29,411	-
Hiring of mobile air-conditioning unit without following procurement process	A disciplinary hearing was held and the implicated employee was given a final written warning.	28,350	-
		45,914,522	**-**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

Figures in Rand	2020	2019 Restated*

38. Going concern

The annual financial statements have been prepared on the basis of accounting policies applicable to a going concern. This basis presumes that funds will be available to finance future operations and that the realisation of assets and settlement of liabilities, contingent obligations and commitments will occur in the ordinary course of business

39. Events after the reporting date

1. COVID-19 Pandemic

South Africa and the rest of the world is experiencing a global pandemic called COVID-19.

The World Health Organization declared COVID-19 as a health emergency on 30 January 2020 and a global pandemic on 11 March 2020.

On 6 March 2020 SA confirmed the first case of COVID-19 and the country went into lockdown at 00:00 time on 26 March 2020.

The lockdown was extended on 9 April 2020 to 30 April 2020 and SA progressed to lockdown level 4 from 1 May 2020. The extension of the lockdown meets the definition of an event after reporting date.

The extension as well as the initial lockdown will not have a material impact on the 2019/20 AFS figures as the lockdown was called 5 days before year end. Therefore no adjustments are required for the 2019/20 AFS figures.

COVID-19 will have an effect on each and every entity in the future. The extent (financial and other) is undetermined. This is an unique event throughout the world and there are no past events to use to simulate an outcome expected.

2. Comair Airways Limited

In April 2020, Comair informed SAWS that it will be going under business rescue mainly due to the impact of COVID-19 on its already strained operations. As at 31 March 2020 Comair owed SAWS a total of R 3,778,275 of which R 2,033,065 was 60 days and older. The entity has decided to provide for impairment for the R 2,033,065 in the current financial year.

3. South African Airways and South African Express

A provision for doubtful debts of R 3,182,736 and R 3,645,126 for SA Express and SAA respectively has been provided as they are under business rescue. Our opinion is that once the business rescue process is complete and we know for certain how much SAWS will be entitled to as part of the winding up or claim against the assets, we can write off the remaining debt. We are also unsure whether government will assist these entities financially, which could mean that the amounts under business rescue can still be settled.

*** See Note 34**

Figures in Rand	2020	2019 Restated*

39. Events after the reporting date (continued)

4. Fly Blue Crane (PTY) LTD

Fly Blue Crane (Pty) Ltd went into business rescue in November 2016 and the last form of communication received from the debtor was on 7 February 2019 where an Addendum to purchase Fly Blue Crane (Pty) Ltd by Ciarasat (Pty) Ltd was sent to the South African Weather Service. The amount of the debt is currently at R 535,449.22. This amount has been written as at 31 March 2020, as per Board Resolution.

*** See Note 34**

NOTES:

NOTES:

South African Weather Service

Eco Glades Block 1B, Eco Park,
Cnr Olievenhoutbosch and Ribbon Grass Streets,
Centurion, 0157
Private Bag X097, Pretoria, 0001

Telephone: 012 367 6000
www.weathersa.co.za
Weatherline: Dial *120*7297#
Follow us on Twitter: @SAWeatherServic

RP40/2020
ISBN: 978-0-621-48140-2

Title of Publication: South African Weather Service
Annual Report 2019/20