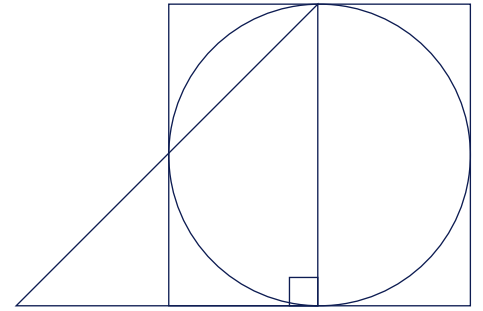


Report

05/06



Faculty of Natural and Agricultural Sciences



Faculty of Natural and Agricultural Sciences

Issued by:
Faculty of Natural and Agricultural Sciences,
University of the Free State

Editorial committee
Lacea Loader
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Language revision
Nanette Lötter

Revision of bibliographical data
Mercia Coetzee

Layout and cover design
Chrysalis advertising and publishing

Photographers
Gerhard Louw
Stephen Collett

Printing
Print 24

The Afrikaans version is also available on a compact disc
from the dean's office or on the university's website at
www.ufs.ac.za.

Cover page: Aspects of natural and agricultural sciences.

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From the Dean's office



Prof. Herman van Schalkwyk.

The Faculty of Natural and Agricultural Sciences at the University of the Free State (UFS) leads the way in the practising of natural and agricultural sciences in South Africa and the highest levels of quality and credibility are reflected.

Our commitment, however, reaches far beyond just this. It reaches beyond the borders of the country and across continents; its multi-disciplinary and practical approach is vested in all the disciplines presented by the faculty.

In 2005/06 the Faculty experienced significant growth in measurable outputs. A contributing factor was the comprehensive apparatus strategy and plan which was implemented in 2005. With this strategy, university funds were used to leverage other funds in order to obtain huge discounts from suppliers of apparatus. In this way the faculty managed to obtain almost R50 million worth of apparatus in 2005.

The strategy was continued in 2006 when an agreement to the value of R7 542 531 was reached with Shimadzu, according to which apparatus was supplied to the faculty at discount prices. The agreement, which is valid for three years, entails the free replacement of apparatus which is purchased during this period with upgraded versions.

The new apparatus forms part of the UFS vision to compete internationally with quality research outputs in certain niche areas, to provide leadership in advanced training to students from the African continent and to establish the university as a leader among South African universities.

Two researchers with a B rating from the National Research Foundation (NRF) were also appointed. Both of these initiatives bore fruit and in 2006 the faculty increased its total research outputs by

about 13%. As an example, the Department of Chemistry's outputs increased by 100%.

The faculty has been bursting at the seams over the past couple of years. Student figures rose from 3 935 undergraduate, postgraduate and occasional students in 2005, to 4 224 in 2006. There is also strong representivity of students from other African countries and in 2005/06 almost 600 students studied at the faculty.

An extended B.Sc. programme has been presented to students since 2005. The programme aims at providing students who do not comply with all the requirements for the B.Sc. programme with the necessary sub-structure to complete the B.Sc. degree successfully. A preliminary evaluation of the results indicates that the programme is delivering the desired results.

The alignment of the Qwaqwa Campus, which was incorporated into the UFS in January 2003, remains a challenge. Regular discussions are held with staff on the campus in order to make the faculty's programmes more sustainable and to align it with the broader strategic plan of the UFS.

On a national level, the faculty is in the process of making its mark in terms of teaching and community service. In 2005 the faculty again actively began utilising its

experimental farms. A three-way agreement between the UFS, the National Farmers Union (NAFU) and the Mangaung Local Municipality led to the establishment of the Lengau Agricultural Development Centre on the Sydenham Experimental Farm. The centre provides training and mentorship to small-scale upcoming farmers.

To be dynamic and progressive requires innovative thinking. It requires commitment and a desire to deliver excellent teaching and learning opportunities to students. It requires a willingness to form partnerships, and a multi-disciplinary and practical approach to the tertiary education environment in South Africa.

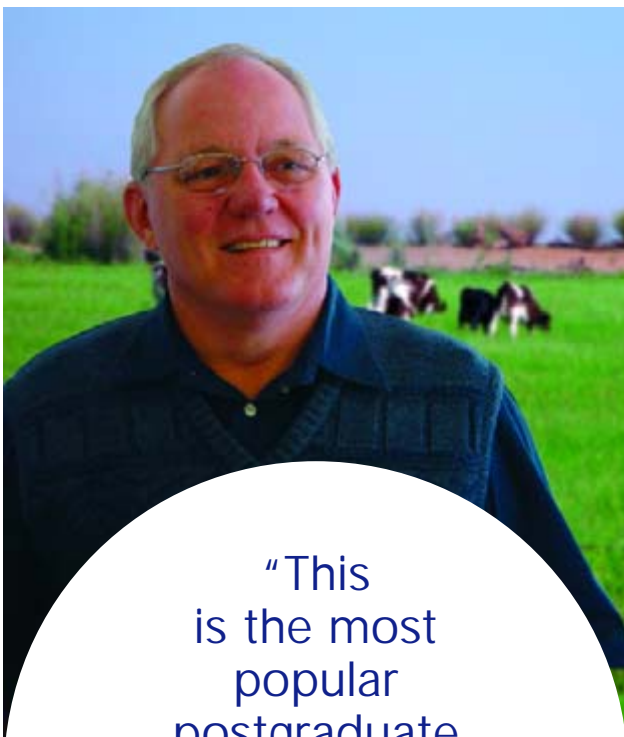
This report covers the faculty's activities in 2005/06. It is a reflection of two years' commitment on the part of a team of skilled and motivated academics and support staff.



Prof. Herman van Schalkwyk

Dean: Faculty of Natural and Agricultural Sciences
University of the Free State

Sustainable Agriculture and Rural Development



“This is the most popular postgraduate agricultural study programme in Southern Africa.”

Prof. Izak Groenewald.

Overview

The Centre for Sustainable Agriculture and Rural Development was established in 1994 by the Faculty of Natural and Agricultural Sciences, in order to offer postgraduate training with a multi-disciplinary approach by means of distance education, and to undertake research with a view to the development and maintenance of sustainable agricultural production systems.

The programme offered by the centre enables students to obtain a master's degree in Sustainable Agriculture (MSA). The UFS is the only university of its kind in Africa to offer this qualification.

As a result of the method of presentation, which entails distance education on a modular basis, the programme is very popular among local and international students. In addition to students from virtually all of the countries of the Southern African Development Community (SADC), students from Ireland, the United Kingdom (UK), the Netherlands, Denmark, Kenya and Ethiopia have completed the programme over the past few years.

Students come from all sectors of the agricultural milieu, including, inter alia, commercial and small farmers, as well as employees of the Department of Agriculture, the Agricultural Research Council (ARC), agricultural co-operatives or industrial institutions such as mining firms involved in the re-establishment of agricultural activities on their exploited grounds. Graduates can either apply their skills directly, for their own personal advantage, or engage in research and comprehensive activities in the domain of their employers or with private consultative enterprises.

Because the socio-economic environment of the farming industry is in a constant state of change, new skills and knowledge must continually be acquired in order to cope with the challenges of tomorrow in a sustainable manner. The programme develops students' technological, managerial and thinking skills in the agricultural industry, with a view to protecting natural resources, especially in respect of the endangered semi-arid areas.

New modules were developed during 2005/06, in order to adjust to the requirements of agriculturalists in respect to the format of part-

“The UFS is the only university of its kind in Africa to offer a masters degree in Sustainable Agriculture.”

A highlight of the year 2005 occurred when Dr Aldo Stroebel became the centre’s first Ph.D. graduate. Dr Stroebel’s research focused on the role of stock farming among rural communities in the northern region of the Limpopo Province. The research linked up with similar studies that he had conducted in a group context in Kenya, in collaboration with researchers from Cornell University in the United States of America (USA). Several scientific publications resulted from his research.

time agricultural training. This led to the development and implementation of new modules within various focus areas, namely sustainable plant and animal production systems, agri-business management, the adding of value, marketing and rural development.

In 2005, 48 students were selected for the programme. The student intake of 2006 once again confirmed the relevance of the programme, with approximately 50 students being selected from amongst more than 100 candidates. There were applicants from various SADC countries, such as Namibia, Lesotho, Swaziland, Zambia and Botswana, as well as other African countries, including Ethiopia.

Collaboration with the following institutions has been established and maintained in various ways:

- National University of Lesotho
- University of Namibia
- University of Virginia, USA
- Cornell University, USA
- Royal Agricultural College, UK
- Imperial College London, Wye Campus
- Dronten Professional Agricultural University, Netherlands
- University of Wageningen, The Netherlands



Children in the Vhembe district of the Limpopo Province. The photo was taken during a research project which led to Dr Aldo Stroebel’s Ph.D.



Attending the inaugural lecture of Prof. Edward Nesamvuni, Professor Extraordinary at the centre are, from the left: Prof. Izak Groenewald, Director of the centre, Nesamvuni, Neil Heideman, Vice-Dean: Faculty of Natural and Agricultural Sciences at the UFS and Magda Fourie, Vice-Rector: Academic Planning at the UFS.

“The year 2006 was characterised by the recognition of notable scientists and researchers as professors extraordinary.”



In front of the Main Building of the Royal Agricultural College for Science and Technology in the United Kingdom are, from the left: Dr Stephen Chadd, Prof. Izak Groenewald, Director of the centre and Dr Richard Baines. Drs Chadd and Baines are from the Royal Agricultural College for Science and Technology.

In 2005 Prof. Izak Groenewald, Director of the centre, was appointed to the editorial staff of the *Journal for Sustainable Agriculture*, an internationally recognised scientific journal.

The congress of the European Association for Animal Production (EAAP) was held in 2005 at Bled, Slovenia. During the congress, Prof. Groenewald delivered a paper on new tendencies in food provision for stock in rural areas.

The year 2006 was characterised by the recognition of notable scientists and researchers as professors extraordinary in the centre. Proff. Alice Pell of Cornell University in the USA and Edward Nesamvuni, formerly of the University of Venda but currently director in the Department of Agriculture, were honoured in this way.

A threefold collaboration partnership was established between the University of Venda, the University of Cornell in the USA and the UFS. It was later expanded to include the Department of Agriculture in the Limpopo Province. The nature of collaboration involves the identification of research opportunities, the creation of funding possibilities and the conducting of joint projects.

Furthermore, a visit was paid to the Royal Agricultural College for Science and Technology, as well as to the Wye Campus of the Imperial College London, both in the UK. These institutions offer similar learning programmes to the one at the UFS, and existing course contents and new ideas were exchanged.



The graduation ceremony of the first Ph.D. student of the centre. From the left, are: Prof. Alice Pell, Cornell University, USA, Dr Aldo Stroebel, graduate, prof. Frans Swanepoel, Director: Research Development at the UFS and Izak Groenewald, Director of the centre. Prof. Pell and Swanepoel were the co-promoters and Groenewald was the promoter.

Academic staff

Director: Prof. Izak Groenewald

Professors Extraordinary: Proff. Frans Swanepoel, Edward Nesamvuni, Alice Pell

Contractual Professor: Prof. Kobus Laubscher

Senior Researchers: Drs Aldo Stroebel, Florence Nherera

Programme Co-ordinator: Ms Mia Kirsten

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Statistical data of the faculty



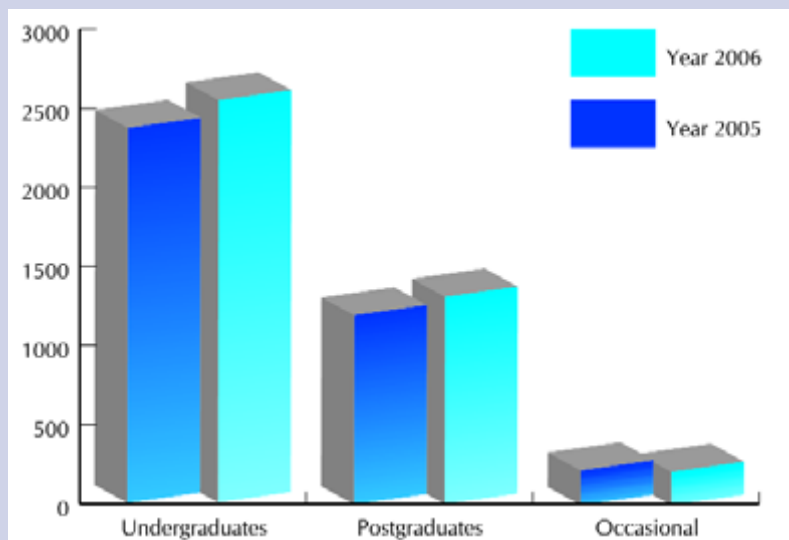
Student figures

Faculty of Natural and Agricultural Sciences, 2005/06

Male					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	676	31	26	724	1457
Postgraduate	351	22	15	400	788
Occasional	84	3	4	17	108
Total 2005	1111	56	45	1141	2353
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	729	28	21	768	1546
Postgraduate	385	21	16	431	853
Occasional	68	2	2	23	95
Total 2006	1182	51	39	1222	2494

Female					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	563	41	11	394	1009
Postgraduate	206	16	11	221	454
Occasional	101	5	2	11	119
Total 2005	870	62	24	626	1582
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	641	39	17	401	1098
Postgraduate	243	15	17	234	509
Occasional	103	2	2	16	123
Total 2006	987	56	36	651	1730

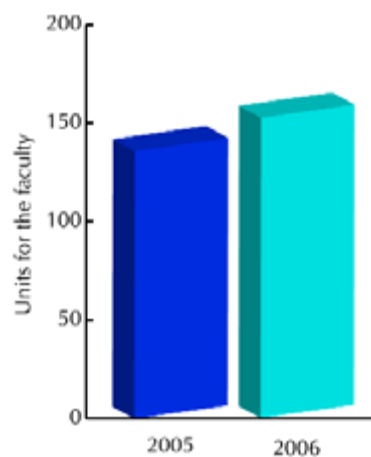
Total					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	1239	72	37	1118	2466
Postgraduate	557	38	26	621	1242
Occasional	185	8	6	28	227
Total 2005	1981	118	69	1767	3935
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	1370	67	38	1169	2644
Postgraduate	628	36	33	665	1362
Occasional	171	4	4	39	218
Total 2006	2169	107	75	1873	4224



Student figures

Student nationality		
Nationality	2005	2006
Angola	1	
Asian countries	21	18
Botswana	20	20
European countries	6	6
Lesotho	142	142
Malawi	2	1
Mauritius		2
Mozambique	8	7
Namibia	40	42
No information	1	
North America	4	4
Other Africa	45	48
South Africa	3610	3893
South America		1
Swaziland	13	13
Zambia	4	6
Zimbabwe	18	21
Total	3935	4224

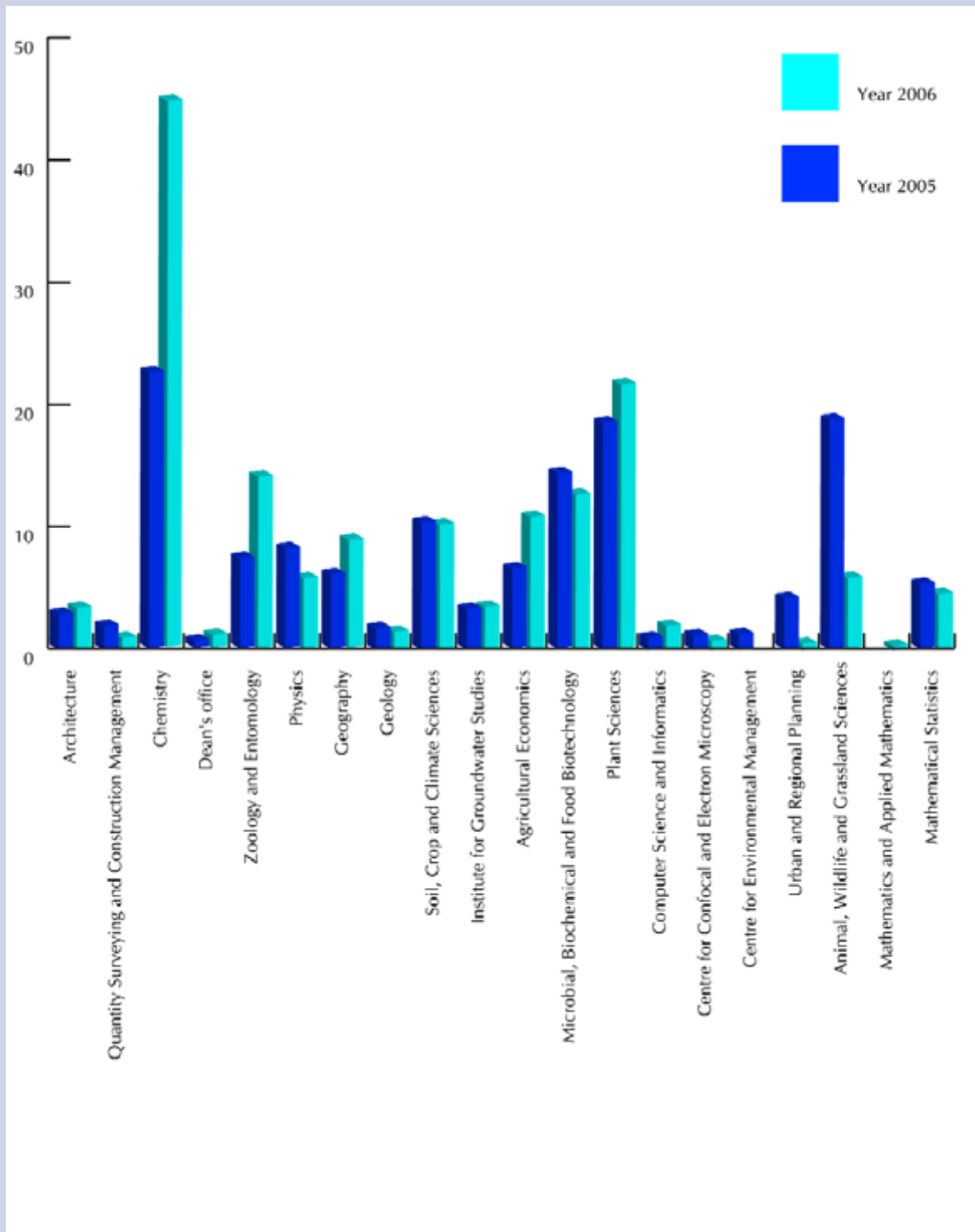
Research outputs for the Faculty of Natural and Agricultural Sciences



Articles published in accredited approved research journals.

Departmental research outputs

Articles published in accredited approved research journals, 2005/06



Glossary



Glossary

A

ACIAR	Australian Centre for International Agricultural Research
AEASA	Agricultural Economics Association of South Africa
ALPRU	African Large Predator Research Unit
ARC	Agricultural Research Council
ARMSCOR	Armaments Corporation of South Africa
ARS	Agri Risk Specialists
ASAQS	Association of South African Quantity Surveyors
ASSA	Anatomical Society of South Africa
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
AVS	American Vacuum Society

C

CANSA	Cancer Association of South Africa
CATSA	Catalysis Society of South Africa
CBD	Convention of Biological Diversity
CCEM	Centre for Confocal and Electron Microscopy
CePHMa	Centre for Plant Health Management
CfPB	Centre for People and Buildings
CIAT	International Centre for Tropical Agriculture
CIDB	Construction Industry Development Board
CIMMYT	International Maize and Wheat Improvement Centre
CIOB	Chartered Institute of Building
CIOB-SA	Chartered Institute of Building - South Africa
CSACEE	Central South African Council on Economic Education
CSIC-INTA	Centro de Astrobiología
CSIR	Council for Scientific and Industrial Research
CSIRO	Commonwealth Scientific and Industrial Research Organisation

D

DEAT	Department of Environmental Affairs and Tourism
DiMTEC	Disaster Management Training and Education Centre for Africa
DMISA	Disaster Management Institute of South Africa
DST	Department of Science and Technology

E

EAAP	European Association for Animal Production
EASA	Education Association of South Africa
ECA	European Crystallographic Association
EIGG	Environmental Inorganic Geochemistry Group
EPWP	Expanded Public Works Programme
ESBES	European Symposium on Biochemical Engineering Science
ESREL	European Safety and Reliability
ESRP	Economic and Social Rehabilitation Programme

F

FAO	Food and Agriculture Organisation
FEMS	Federation of European Microbiological Societies
FMP	Facilities Management Programme
FOTIM	Foundation of Tertiary Institutions of the Northern Metropolis

FSRPO	Free State Red Meat Producers Organisation
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G

GIS	Geographical Information Systems
Glen ADI	Glen Agricultural Development Institute
GM	Genetically Modified
GMBA	Gauteng Master Builders' Association
GMO	Genetically Modified Organisms
GWK	Griekwaland-Wes Koöperasie

H

HIV	Human Immunodeficiency Virus
HPCSA	Health Professions Council of South Africa
HPLC	High Performance Liquid Chromatography
HSPCM	Health and Safety Programme for Construction Managers

I

IAGOD	International Association on the Genesis of Ore Deposits
IAH	International Association of Hydrogeologists
ICCC	International Conference on Coordination Chemistry
ICEC	International Cost Engineering Council
ICID	International Commission on Irrigation and Drainage
ICP	Inductively Coupled Plasma
ICRBM	International Conference on Rodent Biology and Management
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDC	Industrial Development Corporation
IGS	Institute for Groundwater Studies
IITA	International Institute of Tropical Agriculture
INCRoP	Insects on New Crops Programme
INTSORMIL	International Sorghum and Millet Research Support Programme

IPMA

IPMA	International Project Management Association
IPMP	Intensive Project Management Programme
IRDP	Institutional Research and Development Programme
IRWH	In-field Rainwater Harvesting
IUCr	International Union of Crystallography
IUMS	International Union of Microbial Societies
IUPAP	International Union of Pure and Applied Physics

J

JFM	Journal of Facilities Management
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L

LExEn	Life in Extreme Environments
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M

MIRCHEN	Microbiological Resources Centre
MIT	Massachusetts Institute of Technology
MRM	Mineral Resource Management
MSA	Master's Degree in Sustainable Agriculture
MSSA	Microscopy Society of Southern Africa
MUCPP	Mangaung University Community Partnership Programme
MURP	Master's Degree in Urban and Regional Planning

N

NaCOF	National Climate Outlook Forum
NAFU	National African Farmers Union
NAMC	National Agricultural Marketing Council
NASA	National Aeronautics and Space Administration
NASSP	National Astrophysics and Space Science Programme
NCEE	National Council for Economic Education
NDA	National Department of Agriculture
NECSA	National Energy Commission of South Africa
NELSAM	Natural Earthquake Laboratory in South African Mines
NERPO	National Emergent Red Meat Producers' Organisation
NGO	Non-Governmental Organisation
NML	National Metrological Laboratory
NMMU	Nelson Mandela Metropolitan University
NMR	Nuclear Magnetic Resonance
NRF	National Research Foundation
NUFU	Norwegian Council of Universities Committee for Development, Research and Education
NWGA	National Wool Growers' Association

O

OABS	Optimal Agricultural Business Solutions
OECD	Organisation for Economic Co-operation and Development

P

PARSA	Parasitological Association of Southern Africa
PDMIW	Processing and Disposal of Mineral Industry Wastes
POT	Peaks over Threshold
PPP	Public Private Partnership
PRT	Protein Research Trust

R

RICS	Royal Institute of Chartered Surveyors
RIEP	Research Institute of Education Planning
RNA	Research Niche Area
RPO	Red Meat Producers' Organisation

S

SA	South Africa
SAACE	South African Association of Consulting Engineers
SAB	The South African Breweries Limited
SACI	South African Chemical Institute
SACPCMP	South African Council for the Project and Construction Management Profession
SACPVP	South African Council for the Property Valuation Profession
SACQSP	South African Council for the Quantity Surveying Profession
SADC	Southern African Development Community
SAFMA	South African Facilities Management Association
SAFOI	South African Fryer Oil Initiative
SAIP	South African Institute of Physics
SAISC	Southern African Institute of Steel Construction
SAMSI	Statistical and Applied Mathematical Sciences Institute

SANCIAHS	South African National Committee for the International Association of Hydrological Sciences	SEDA	Small Enterprise Development Agency	UNEP	United Nations Environment Programme
SANCU	South African National Consumer Union	SMME	Small, Medium and Micro Enterprises	UNESCO	United Nations Educational, Scientific and Cultural Organisation
SANPAD	South Africa-Netherlands Research Programme on Alternatives in Development	SRC	Student Representative Council	USA	United States of America
SAPOA	South African Property Owners' Association	SRL	Sustainable Rural Livelihood	USAID	United States Agency for International Development
SAPS	South African Police Services	SSAG	Society of South African Geographers	UTCHEM	University of Texas Chemical Compositional Simulator
SAQA	South African Qualifications Authority	T		UWC	University of the Western Cape
SASAS	South African Society for Animal Science	THRIP	South African National Research Foundation Thrust for Industry-Related Projects	W	
SASQUA	Southern African Society for Quaternary Research	TUE	Technical University Eindhoven	WARFSA	Water Research Fund of Southern Africa
SAVAH	South African Association of Visual Arts Historians	U		WATOC	World Association of Theoretically Orientated Chemists
SBE	Sustainable Built Environments	UCT	University of Cape Town	WFP	World Food Programme
		UFS	University of the Free State	WITS	University of the Witwatersrand
		UJ	University of Johannesburg	WRC	Water Research Commission
		UK	United Kingdom	WUA	Water Users' Association
		UN	United Nations		