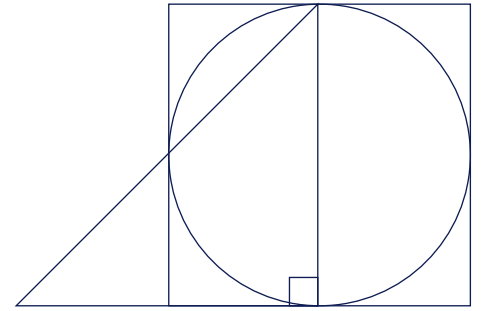


Report

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
Leonie Bolleurs

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.

Contact details

Dean

Prof. Herman van Schalkwyk
+27 51 401 2535
hvs.sci@ufs.ac.za

Vice-Dean

Prof. Neil Heideman
+27 51 401 3855
heidemannj.sci@ufs.ac.za

Office of the Dean

Ms Lorinda Rust
+27 51 401 2322
rustl.sci@ufs.ac.za

Faculty Manager

Ms Corné Havemann
+27 51 401 2490
havemach.sci@ufs.ac.za

Liaison

Mr Nelis Maeder
+27 51 401 2531
maedecj.stg@ufs.ac.za

Physical address of the office of the Dean

Room 9A, Biology Building, Main
Campus, Bloemfontein

Postal address

University of the Free State
PO Box 339
Bloemfontein
South Africa
9300

Fax

+27 51 401 3728

Faculty website

www.ufs.ac.za

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

Lengau Agricultural Development Centre



“The centre provides training and support to small farmers.”

Dr. Léan van der Westhuizen.

Overview

The Agricultural Skills Development, Training and Mentorship Programme is an initiative of the Faculty of Natural and Agricultural Sciences that utilises its academic capacity and facilities to make a significant difference in sustainable agriculture to the region, country and continent.

The UFS owns three experimental farms to the south of Bloemfontein. These farms are utilised for training, research and community service. Some of the farms are earmarked for agricultural skills development and training of emerging farmers, farm workers and entrepreneurs in agricultural business.

The facilities are also utilised and earmarked for alternative natural and agricultural skills development opportunities in brick-making, construction, value-adding and compost production. The buildings, facilities and a portion of the land of the Sydenham Experimental Farm are allocated to the Lengau Agricultural Development Centre.

These facilities are utilised to address the needs of newly-settled, emerging and commercial black farmers. Services range from livestock auctioneering, branding, dehorning, castration and primary herd care. The centre also serves as a centre for the education of under- and postgraduates, mentors, farmers and black entrepreneurs in many aspects of livestock, crop farming and agri-business.

In December 2004 the university, the Mangaung Local Municipality and the National African Farmers Union (NAFU) embraced the programme as partners in agricultural transformation and signed a memorandum of understanding.

The centre aims to simultaneously undertake systematic small farmer training, tackle local development issues, and enrich the curriculum in terms of research and training at the UFS. Some of the projects undertaken at the centre include:

- Training of community members of the Mangaung Local Municipality, particularly the residents of the informal settlement

“During 2006 a number of outcomes were achieved by the centre in collaboration with several partners.”

- within the immediate vicinity of the experimental farms.
 - Training of emerging farmers who were recently allocated land under the land reform programme, but who are unable to make a success of their farming operations due to inexperience and lack of technical support.
 - Developing and presenting of short courses in practical agriculture in line with dominant conditions encountered by the target groups.
 - Farm demonstrations.
 - Research to identify factors that enhance competitiveness.
 - Strengthening the practical aspects of the curriculum for on-going community service learning of the students on the three campuses of the UFS.
 - An outreach programme through partnerships to extend the clientele through a "hub-and-spokes" framework to different parts of the country.
 - Providing a support facility to emerging commercial farmers where training and implementation assistance can be supplied to livestock and crop farmers.
 - Participating and assisting in Agri Black Economic Empowerment initiatives.
- Establishing an HIV/Aids prevention, care and support initiative amongst farmers, farm workers and associated communities.

During 2006 a number of outcomes were achieved by the centre in collaboration with several partners. In conjunction with the National Emergent Red Meat Producers' Organisation (NERPO) and Mangaung Local Municipality, 12 farmers' days were held in the Motheo district where farmers were skilled in vaccination, branding, dehorning, castration and tick control. They also received training and advice in bull selection for the improvement of livestock. More than 2 500 head of cattle were handled and 76 farmers attended the sessions. Six small and medium enterprises in branding, dehorning and dipping resulted from these sessions.

Eleven people were trained in broiler production skills at the centre. All are currently poultry farmers. A presenter from the Institute of Dairy Technology in Pretoria trained 15 persons on primary herd care.

Four hydroponic units were erected and vegetable production skills were offered to eight women. The project also provided seedlings to 70 households within the HIV/Aids programme of the Department of Social Development. Seventy HIV/Aids-



A training session in the branding of cattle.

affected households were trained in vegetable production, each managing a doorframe unit.

Five sessions on HIV/Aids prevention, care and support were presented to staff and project beneficiaries at the Lengau Agricultural Development Centre, Botshabelo and Thaba' Nchu. The objective of these sessions was to equip attendants with basic information on HIV/Aids and to impress upon them the importance of knowing one's status. Feedback received from the participants during and after the sessions was very positive.

The faculty in partnership with ECIAfrica (an indigenous economic development consultancy and capacity building organisation) launched the Agricultural Business Unit at the centre to promote agricultural linkages among producers and consumers, and to promote the development of Small, Medium and Micro Enterprises (SMME's) in the process. Funding for the initiative was obtained from the United States Agency for International Development (USAID). A project co-ordinator, assistant and seven part-time consultants were appointed within the project.

Five black cattle owners house approximately 240 head of cattle overnight in the feedlot pens.

One self-employed black woman managed six cycles of the 250-bird broiler house. Five black pig owners are utilising the 50-sow piggery at the centre.

Knitting equipment was funded and is utilised by three black women and one black man in a project of the Department of Consumer Sciences.

The auctioneering activities resulted in an average turnover of approximately R624 000 per month. One percent commission of the turnover is earned per auction session. The availability of a scale at



During a visit from the United States Agency for International Development to the Main Campus were, from the left, seated: Mss Deborah Kahatano, ECIAfrica, Dana Mullins, USAID, Juliana Rwelamira, ECIAfrica and Lynette van Niekerk, USAID; back: Mr Challa Mohloli, co-ordinator of the UFS USAID programme, Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS, Dr Léan van der Westhuizen, Head of Lengau Agricultural Development Centre, and Ms Lieketseng Kolisang, Research Assistant at Lengau Agricultural Development.



A demonstration and training in dehorning.

the auctioning ring, and providing the black cattle owners with the necessary information, motivated more of them to utilise the facility to market their animals. The farmers also took note of the price-determining properties and are in the process of changing their stock accordingly.

The centre, in partnership with the Free State Provincial Department of Agriculture, is also involved in the revitalisation of six hydroponics projects in the Free State Province.

Research outputs

Publications

Mataxas, L., Thobejane, K., Netshiukhwi, G., Mokgothu, K., Morojele, E. & Mabula, E. 2005. Peri-urban renewal through agriculture: A case study of identified opportunities to alleviate poverty in JB Mafora Free State Province, South Africa. *ARC Report Series 7: 47.*

Staff

Senior Lecturer: Dr Léan van der Westhuizen

Personal Assistant and Community Service Officer: Ms Kholofelo Thobojane

Community Development Officer: Ms Lolly Tlhomola

Project co-ordinator in the Agricultural Business Unit: Mr Challa Moahloli, Ms Lieketseng Kolisang (assistant)

Contact details

Dr Léan van der Westhuizen
Lengau Agricultural Development Centre
University of the Free State
PO Box 12544
Brandhof
Bloemfontein
South Africa
9324

Telephone: +27 51 443 8859

Fax: +27 51 443 8092

E-mail: mcvdw@telkomsa.net

Website: www.ufs.ac.za



A group of farmers receiving training in branding, dehorning and dipping.

Statistical data of the faculty



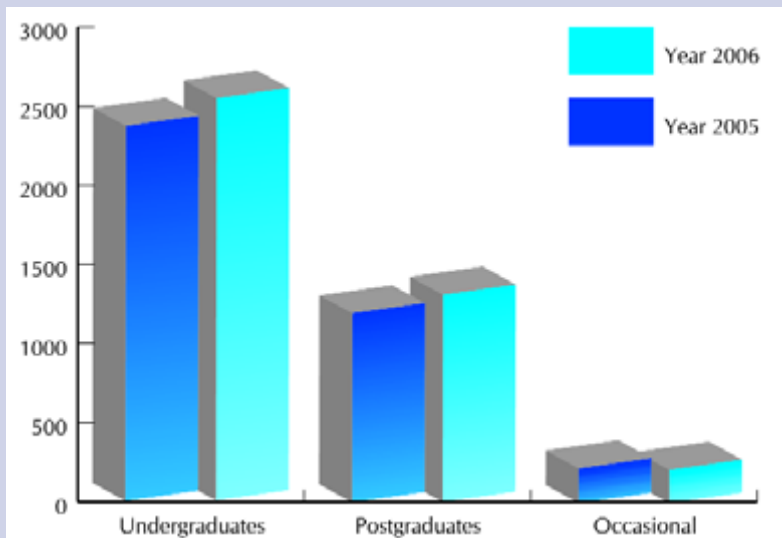
Student figures

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

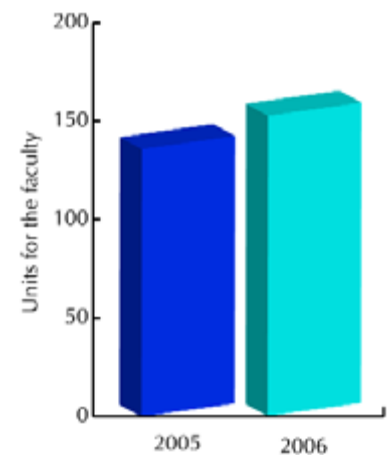
Total					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	1239	72	37	1118	2466
Postgraduate	557	38	26	621	1242
Occasional	185	8	6	28	227
Total 2005	1981	118	69	1767	3935
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	1370	67	38	1169	2644
Postgraduate	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

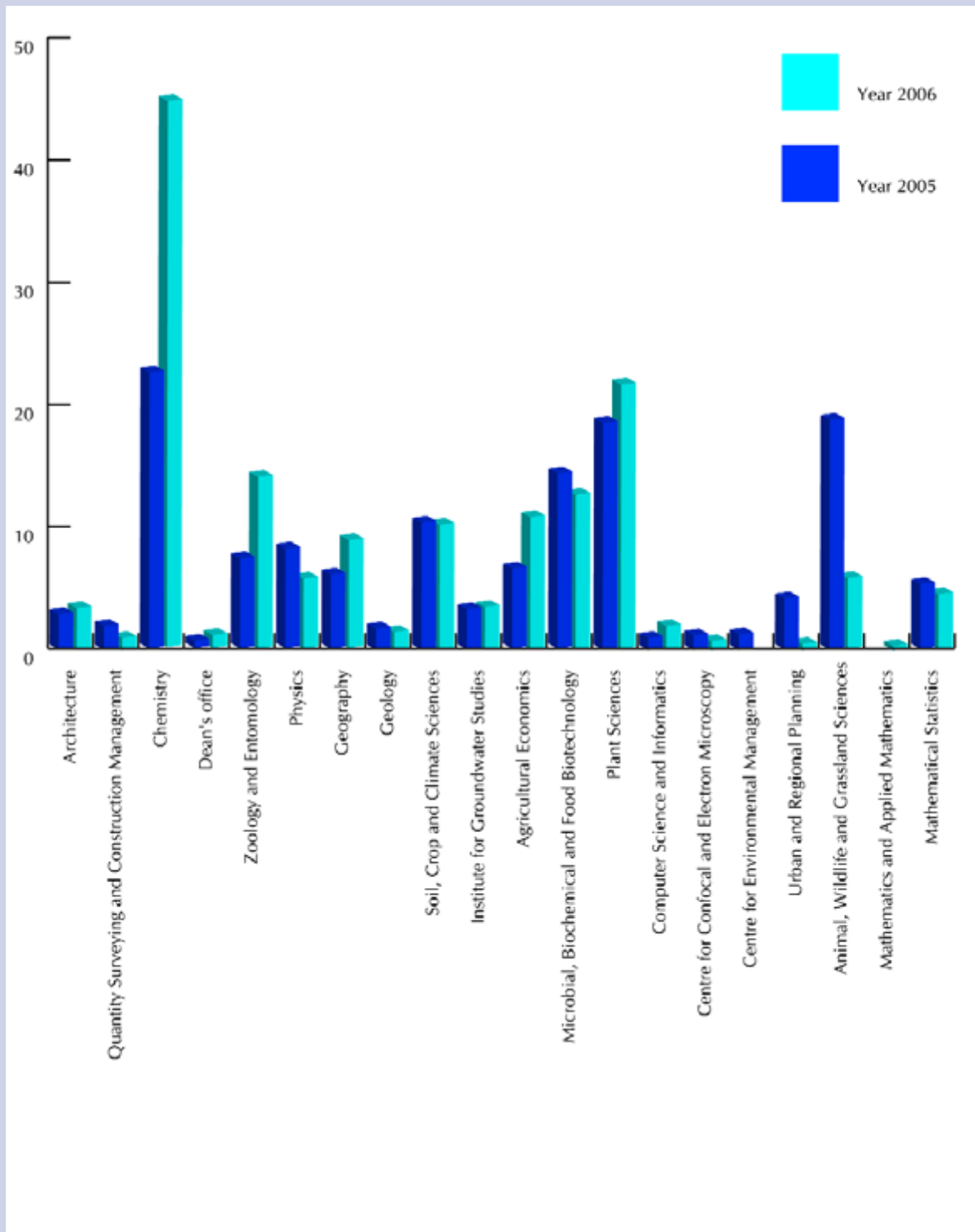
Research outputs for the Faculty of Natural and Agricultural Sciences



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
-------	--

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
-----	----------------------------------

L

LExEn	Life in Extreme Environments
-------	------------------------------

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		