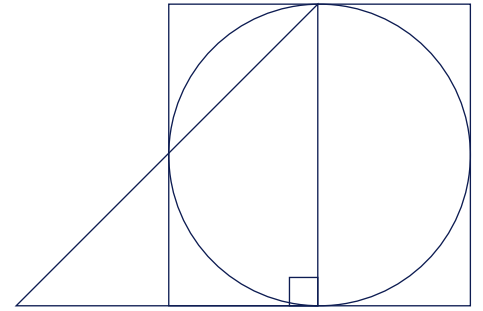


Report

05/06



Faculty of Natural and Agricultural Sciences



Faculty 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.

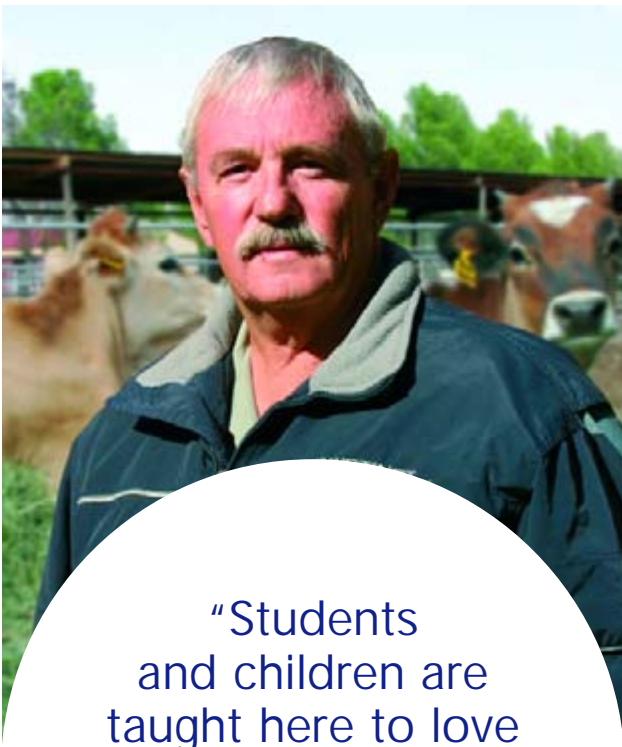
This report covers the faculty's activities in 2005/06. It is a reflection of two years' commitment on the part of a team of skilled and motivated academics and support staff.



Prof. Herman van Schalkwyk

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

Paradys Experimental Farm



“Students
and children are
taught here to love
farm life.”

Mr Cobus van Dyk.

Overview

The Paradys Experimental Farm is situated outside Bloemfontein, on the road to Reddersburg. In 2005/06 the farm's management started focusing on agricultural schools, pre-primary and primary schools in the area to create an awareness of agriculture and farm life amongst learners.

One of the outcomes has been the Free State Youth Show Championships, which has been presented on the farm annually since 2005. In 2006 the Free State team was announced after the Youth Show Championships by Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences. The faculty also sponsored the team's official wear for the National Youth Show Championships, held in Worcester in the Western Cape.

During the same year the farm buildings were upgraded and a boundary fence was erected around the farm. The farm also became a popular venue for the presentation of information days for commercial and upcoming farmers.

In 2005 the dairy parlour on the farm, which housed 15 Friesian and Jersey cows, was extended to accommodate 88 cows. Jersey SA donated two heifers, the existing Afrikaner stud grew from 70 to 173 cows, the Dorper stud was extended and goats were acquired to extend the small stock.

Another focus point of the farm is student training. Various departments in the faculty use the farm for research purposes and for practical training of undergraduate and postgraduate students.

In 2005 the farm was used by several agricultural organisations for experiments. Senwes conducted a successful feeding experiment with sheep and Meadows carried one out with calves.

A weather station was established with the help of Prof. Leon van Rensburg, Lecturer at the Department of Soil, Crop and Climate Studies, to determine forecasts in the weather pattern.

The popularity of the farm increased in 2006 and it was mainly used for farmers' days, training and the launch of agricultural equipment.

“Learners are actively involved with the farm by working there over weekends.”

Several school groups in the area also visited the farm.

The introduction of the farm to learners from agricultural schools was taken a step further with an agreement between the faculty and the Hendrik Potgieter Agricultural School in Reddersburg. In terms of this agreement, learners are actively involved with the farm by working there over weekends to gain practical experience.

Seven of the foremost stud farmers of the Afrikaner Cattle Breeders Society of South Africa have established a core herd on the farm. Each stud farmer donated five heifers



In 2006 the Free State team for the National Youth Show received a sponsorship for clothing from the faculty. Here are, in front: Elmé Smith, from President Brand Primary School in Bloemfontein; back, left: Werner Smit, from Hendrik Potgieter Agricultural School in Reddersburg, Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS, Mr Deon Nel, Headmaster of the Hendrik Potgieter Agricultural School and Jacques le Roux, from Landboudal High School in Jacobsdal.



Grade 1 learners from the Hendrik Potgieter Agricultural School in Reddersburg during a visit to the experimental farm.

to the project. In return, the farmers will annually receive a performance-tested bull or semen of a performance-tested bull from the core herd. With the establishment of this herd, a genetically outstanding herd will be created which will be used for the training of students, as well as for research and for information sessions for farmers. All the animals that cannot be used by the herd or the stud farmers will be made available for auctioning at the Paradys Experimental Farm. The herd will be kept under commercial conditions to ensure that only those animals that have adapted will be made available to the industry.

The UFS became the first tertiary institution in the world to mechanise the in-field rain water harvesting technique on a commercial scale by cultivating a summer crop on 100 ha at the experimental farm. Prof. Van Rensburg presented a farmers' day in May 2006 to demonstrate this technique. Most of the 100 farmers who attended

the day were from 42 rural communities in the Thaba 'Nchu area. A group of seven farmers from KwaZulu-Natal also attended.

The Department of Architecture at the UFS presented a workshop on the farm in July 2006 to demonstrate several building techniques. Students built houses of, among other things, hay bales and home-made clay stones. A new gardening method, Permaculture, was also demonstrated.

Part of the upgrading of the farm was the purchasing of a Keenan feeding mixer and a McCormick MC 115 tractor. The feeding mixer makes it possible to mix food for the 50 Jersey cows in a shorter period of time and less fuel is used in the process.

The purchasing of the tractor was made possible by a sponsorship of R100 000 by BUO Agri in Bullfontein, who serve as agents for McCormick. In 2006 about 300 ha of soil were used for the cultiva-



Attending the handing-over ceremony of the brand new McCormick tractor was, from the left: Mr Danie Nortjé, National Service and Product Manager of McCormick SA, Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences, Mr Ian Bothma, M.Sc. student at the UFS and Mr Jan Jacobs, Sales Agent of McCormick SA.



The in-field rain water harvesting technique was demonstrated during a farmers day to upcoming farmers from as far away as KwaZulu-Natal. Here are Prof. Leon van Rensburg, lecturer at the Department of Soil, Crop and Climate Studies and Mr Patrick Molatodi, Chairperson of the Tswelopele Small Farmers Association in a mealie land on the farm used especially for this purpose.

tion of mealies and wheat, which are used as basis for the feed of cows on the experimental farm.

The cultivars will in future also be used by postgraduate students for experiments. The farm will also in the future conduct experiments with seeds for seed companies.

Staff

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Statistical data of the faculty



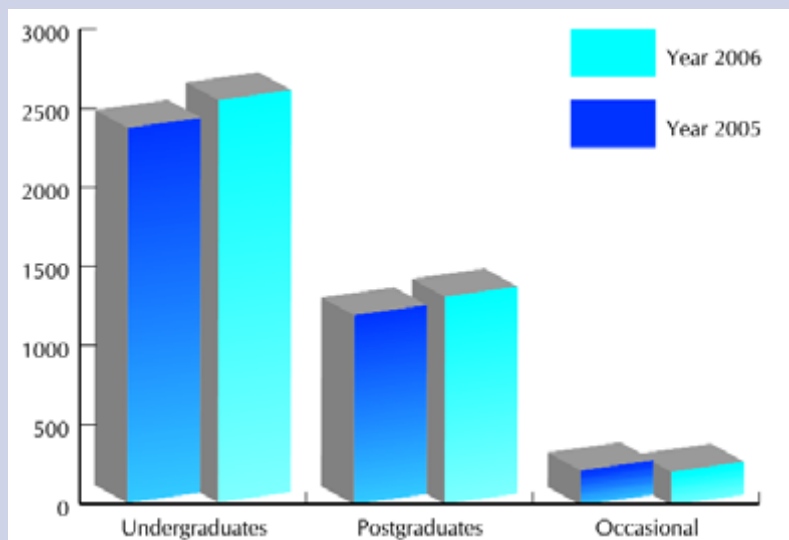
Student figures

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

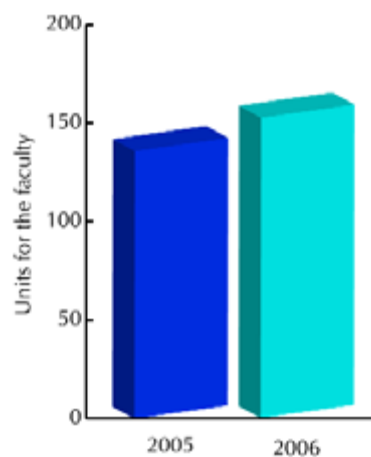
Total					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	1239	72	37	1118	2466
Postgraduate	557	38	26	621	1242
Occasional	185	8	6	28	227
Total 2005	1981	118	69	1767	3935
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	1370	67	38	1169	2644
Postgraduate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

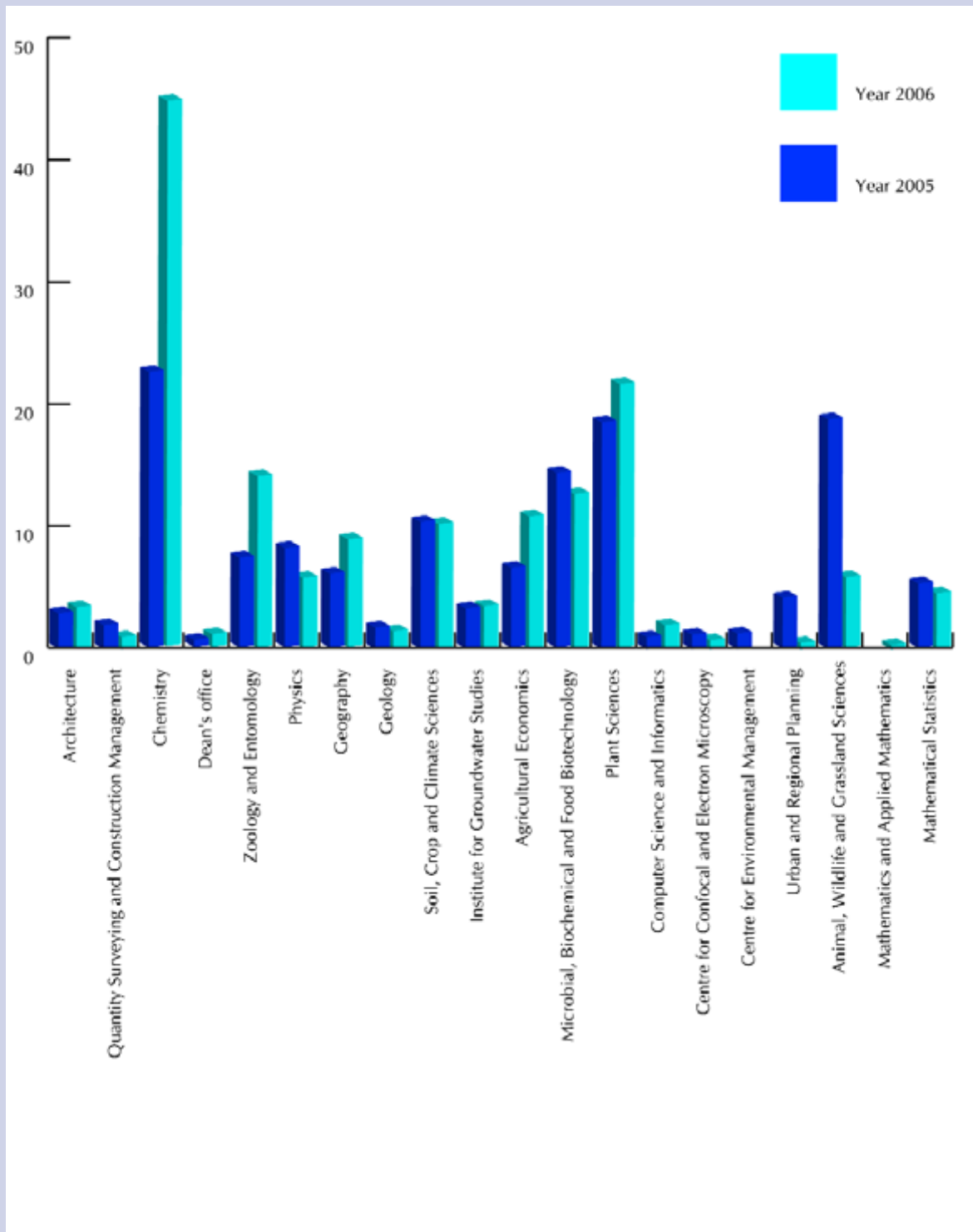
Research outputs for the Faculty of Natural and Agricultural Sciences



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

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

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

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		