



DSI-NRF  
Centre of Excellence  
in Food Security



# 2021

Centre of Excellence in Food Security (CoE-FS)


# ANNUAL REPORT






# ANNUAL PROGRESS REPORT 2021 (APR 2021)

## **DSI-NRF Centre of Excellence in Food Security (CoE-FS)**

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 Food Security SA

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## Acronyms / abbreviations

AAMP	Agriculture and Agro-Processing Master Plan	FOPL	Front of Package Labels
ARC	Agricultural Research Council	FSNet-Africa	Food Systems Research Network for Africa
ARUA	African Research Universities Alliance	GCRF	Global Challenges Research Fund
ASSAf	Academy of Science of South Africa	GFS	Global Food Security Conference
ASSURE	Agent-based modelling of Social Segregation and Urban Expansion	GHS	General Household Survey
BDU	Bahir Dar University	GovInn	Governance Innovation
BVM	Breede Valley Municipality	GSA	Grain South Africa
CA	Collaborating Agreement	HICD	Human and Institutional Capacity Development
CaBFoodS		HMT	Heat Moisture Treatment
-Africa	Capacity Building in Food Security for Africa	HPH	High-Pressure Homogenisation
CDM	Child-directed marketing	HPL	Health Promotion Levy
CHEC	Cape Higher Education Consortium	HSRC	Human Sciences Research Council
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement / French Agricultural Research Centre for International Development	ICP-OES	Inductively Coupled Plasma Optical Emission
CoE-FS	DSI-NRF Centre of Excellence in Food Security	IR HMT	Infrared Heat Moisture Treatment
CoP	Community of Practice	ISD	Institute for Social Development
CSG	Child Support Grant	KPA	Key performance area
DAFF	Department of Agriculture, Forestry and Fisheries	KSQ	Key Sustainability Questions
DALRRD	Department of Agriculture, Land Reform and Rural Development	KU Leuven	Katholieke Universiteit Leuven
DHS	Demographic and Health Surveys	LEAP-Agri	Long-term Europe-Africa Research and Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture
DoH	National Department of Health	MAK	Makerere University
DRDAR	Eastern Cape's Department of Rural Development and Agrarian Reform	MANCO	Management Committee
DSI	Department of Science and Innovation	MoU	Memorandum of Understanding
DUT	Durban University of Technology	MU	University of Missouri
DVC	Deputy Vice-Chancellor / Deputy Principal	NIDS-CRAM	National Income Dynamics Study – Coronavirus Rapid Mobile Survey
ECD	Early Childhood Development	NRF	National Research Foundation
EDP	Western Cape Economic Development Partnership	NWU	North-West University
EGI	Estimated Glycaemic Index	OFSP	Orange Fleshed Sweet Potato
EU	European Union	PI	Principal Investigators
FAO	Food and Agriculture Organization of the United Nations	PL	Project Leaders
FDA	United States Food and Drug Administration	PSA	Potatoes South Africa
		ROFE	Researching the Obesogenic Food Environment
		ROT1	The Crop Rotation 1
		SACSoWACH	South African Civil Society for Women's Adolescents' and Children's Health

SADC	Southern African Development Community	UFH	University of Fort Hare
SAFL	Southern Africa Food Laboratory	UG	University of Ghana
SALGA	South African Local Government Association	UJ	University of Johannesburg
SAMRC	South African Medical Research Council	UKRI	UK Research and Innovations
SARCHI	South African Research Chairs Initiative	UKZN	University of KwaZulu-Natal
SCFA	Short-chain Fatty Acid	UL	University of Limpopo
SCICOM	Scientific Sub-Committee	UMD	University of Maryland
SLA	Service Level Agreement	UNAS	Uganda National Academy of Sciences
SLF	Sustainable Livelihoods Foundation	UNDESA	United Nations Department of Economic and Social Affairs
SONA	State of the Nation Address	UNISA	University of South Africa
SSB	Sugar-sweetened beverages	UP	University of Pretoria
Stats SA	Statistics South Africa	USDA	United States Department of Agriculture
STEERCOM	Steering Committee	UWC	University of the Western Cape
SU	Stellenbosch University	VU	Stichting Vrije University
TAFS	The Transition to Agroecological Food Systems	WCG	Western Cape Government
TARDI	Tsolo Agricultural and Rural Development Institute	WFP	Women on Farms Project
Tgel	The gel point temperature	WHO	World Health Organization
TPP	Transformative Partnership Platform	Wits	University of the Witwatersrand
TUT	Tshwane University of Technology	WP	Work Package
UCT	University of Cape Town	WRC	Water Research Commission
UD	University of Delaware	WWF	World Wide Fund for Nature



# INTRODUCTION

The DSI-NRF Centre of Excellence in Food Security (CoE-FS) was established in 2014. It is hosted by the University of the Western Cape (UWC) and co-hosted by the University of Pretoria (UP). The CoE-FS's vision is to be a global leader in research, capacity building, knowledge brokerage and service provision in food security and nutrition in Africa. This is to be achieved through collaborations with outstanding institutions and scholars.

The CoE-FS operates as a virtual centre, bringing together the expertise of South African and international institutions across

various disciplines. We receive an annual core grant from the National Research Foundation (NRF), and have successfully bid for additional research grants to increase our output and reach.

Our mission is to undertake research, capacity building and dissemination regarding how a sustainable food system can be achieved, in order to realise food security for poor, vulnerable and marginal populations. Our driving value proposition is that food and nutritional security are imperative for human survival with dignity, and must take into account economic vitality, social justice, and human and environmental health.

## Our goals are to:

### UNDERSTAND FOOD SYSTEMS

To build a comprehensive understanding of the changing national and global food system and how this affects the sustainability, availability, access, utilisation and attributes of food in South Africa.

### IDENTIFY THE 'FOOD INSECURE'

To identify the 'food insecure' in South Africa, where they are located, and what their choices are, and their strategies and opportunities when seeking food security, health and well-being; and to understand how these change in response to the changing food system.

### ENABLE ACCESS TO FOOD

To develop and promote policies, technologies, interventions and products that enable access to affordable and nutritious food in ecological, economic, social and politically sustainable ways.

### GROW RESEARCH CAPACITY

To grow capacity in South Africa to undertake this research through training, grants and bursaries.



We have pursued these goals through:

- **Transdisciplinary modes of inquiry:** This mode of knowledge production and cooperation offers innovative methodologies for high-impact science through understanding and acting on complex societal problems. The design of our research programmes is informed by direct engagement with actors in the food system, in addition to more conventional approaches to scholarly endeavour;
- **A partnership approach in the organisation of our research activities:** This has required building purposive strategic relationships for the co-design and co-ownership of research problems, methodologies and solutions, by the host institutions and our collaborators;
- **A transformative agenda in terms of the South African and African food security situation:** We provide leadership, evidence for decision-making, and informed debate and critique of policies and programmes aimed at addressing food insecurity through a comprehensive and systems approach to development that recognises the underlying causes of food insecurity, including poverty, patriarchy, unemployment and inequality;
- **Research excellence:** We see this as both increasing our output of rigorous fundamental and applied research, and increasing our impact as determined by citations, peer review, research ratings, alternative metrics (altmetrics) and evidence of the use of research papers and products; and
- **Active engagement in knowledge brokerage and stakeholder engagement to contribute to policy development.**

The CoE-FS has adopted a comprehensive 'farm to fork' approach to the food system. We contend that in the African context, food security is shaped not simply by agro-ecological factors, but also by the terms on which producers, processors, distributors and consumers participate in the food system. Understanding this environment requires enquiries grounded in agronomy, political economy, health sciences, humanities and the legal perspective, including the right to food.

To focus our work on our comparative advantages, we prioritise research that includes:

- Multi-level governance and policy dialogues to create a sound and resilient food system at global, national and local level;
- Innovation regarding the sustainability, productivity and utilisation of indigenous African and other locally available foods that affect food security; and
- Quantity, quality, diversity and safety of diets concerning all forms of malnutrition.

As a transdisciplinary approach is vital to deepening our knowledge of each of these areas, our research includes cross-cutting themes:

- A humanities perspective, to explore the complex, dynamic and diverse relationships between food and human beings. Although this has become a discrete project led by UWC, UP and the University of KwaZulu-Natal (UKZN), the research undertaken in all of the CoE-FS programmes continues to be informed by a humanities perspective;
- A food systems perspective, addressing the complexities of the production, processing, marketing, distribution and consumption of food, with consideration of the environmental impacts of the food system. Increasingly, our concern is shifting to local, spatially bound food systems, particularly those in which there are distinct urban/rural flows and dynamics; and
- A social protection and poverty-reduction perspective, concerned with the causes and consequences of – and solutions to – multiple deprivations.

We work as a multidisciplinary team of research leaders, project managers and students, drawn from 37 collaborating institutions in South Africa and abroad. The CoE-FS uses both deductive and inductive reasoning to better understand the changing nature of the food environments of vulnerable consumers and food producers – their responses, food security strategies and choices, in the context of a growing health and environmental crisis.

Furthermore, the CoE-FS continues to seek innovative ways to apply its research at the local level, as well as ways to engage with policymakers, practitioners, other academics and the general public. While pursuing its mission and vision, the CoE-FS makes every effort to contribute to government initiatives and deliver on international development food security priorities.

## In 2021, our research activities included:

South Africa/United Kingdom (UK)  
**BILATERAL RESEARCH CHAIR IN SOCIAL PROTECTION AND FOOD SECURITY (SARChI)**

**UNESCO CHAIR**  
in African Food Systems

Projects funded by the  
**LONG-TERM EUROPE AFRICA RESEARCH AND INNOVATION PARTNERSHIP**  
on Food and Nutrition Security and Sustainable Agriculture (LEAP-Agri)

UP, via the African Research Universities Alliance (ARUA) Centre of Excellence in Food Security, is **LEADING**

### **TWO INTERNATIONAL COLLABORATIVE FOOD SYSTEMS RESEARCH PROJECTS**

funded by the UK Research and Innovation (UKRI) Global Challenges Research Fund (GCRF) – Capacity Building in Food Security for Africa (CaBFoodS Africa), and the Food Systems Research Network for Africa (FSNet Africa). Both are focused on building research capacities within the African food system. FSNet Africa is a collaboration between UP, the University of Leeds and the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN).

# DIRECTORS' REPORT

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**In 2021, the extension of the State of Disaster, additional waves of COVID-19 infections and the emergence of the Omicron variant continued to shape both the research environment of the CoE-FS as well as global, national and local food systems.**

At the most direct level, restricted access to university campuses has meant that the CoE-FS has operated as a virtual office for almost two of the seven years since we were established. Fortunately, due to our multi-institutional nature, we had already adopted audiovisual methods of meeting; and through a leverage grant raised from the German Academic Exchange Service (DAAD), we employed Zoom technologies as early as 2018, and have made use of cloud-based storage since 2014. This has meant that the core administrative activities of the CoE-FS have experienced very little disruption.

It has been at the level of our students that the greatest impact has been experienced. Many students do not live in environments that accommodate scholarly activities easily, and it has been difficult to rebuild the stimulating environments of the laboratories and study spaces that characterised the CoE-FS. Nonetheless, we are grateful that we experienced no additional deaths among the CoE-FS researcher and student community, though we are aware that there have been losses of family members.

At the level of society, it is becoming clear that COVID-19 has had a significant impact on the food and nutrition security of South Africans. The impact on children has probably been the most severe. Our estimate of the impact makes use of the AskAfrica survey. In it, the question 'In the last week, were there children in the household who went to bed hungry because there was not enough money to buy food?' is a standard component of the Household Food Insecurity Access Scale, a grouping of international food security indices. In the 2019 General Household Survey (GHS) conducted by Statistics South Africa (Stats SA), the percentage of children in this position stood at 10.7%, down from 30% in 2002 when the question was first included in a national survey in South Africa. The trend had been steadily downward.

At lockdown Alert level 1 in the final quarter of 2020, the percentage of children going to bed hungry reported by AskAfrica was 24%, down from a peak of 28% at Alert level 4 (April/May 2020). With population increase, this means that the number of hungry children had more than doubled since 2019, growing by 2.7 million from 2.1 million in October 2019 to 4.8 million in October 2020. At Alert level 4, when mobility was severely restricted and remedial actions had not yet kicked in, this reached 5.59 million children, taking South Africa to levels of child hunger last experienced two decades ago.

Although child hunger is a 'subjective outcome' variable that does not reflect the true impact of being without sufficient food, the magnitude of the change is sufficient to raise a red flag concerning child food and nutrition security.

Our collaborative publication of the *South African Child Gauge 2020* was thus a timely intervention, as was recognised in the opening speech given by the First Lady of South Africa, Dr Tshepo Motsepe, at the launch of the *Child Gauge*. We were subsequently invited to present the results to the Technical Coordinating Committee of the Food and Nutrition Security Plan (FNSP).

The United Nations Food Systems Summit (UNFSS) was an especially important event in 2021. The CoE-FS contributed to the summit via the Rapid Food System Assessment (RFSa) that we undertook with funding provided by the Food and Agriculture Organization of the UN (FAO). This consultative process and report were the result of collaboration between the CoE-FS, the European Union (EU), the FAO and the French Agricultural Research Centre for International Development (CIRAD). Following a review of our research undertaken over the past seven years, and our Community of Practice (CoP) meetings, a draft report was submitted to food systems researchers in South Africa for peer review. After revisions, the report was presented to four Food Imbizos, attended by over 120 stakeholders.

## The food system remains shaped by inequities

The final report concluded that the South African food system is characterised by a paradox. The country is in the upper-middle-income group, has the second-largest GDP value and is the most industrialised in Africa. With 60 million people (the fifth-most populous country on the continent), South Africa has a positive food balance, with sophisticated food, nutrition and agricultural policies and many support programmes. However, certain reported food system outcomes are sobering: they include significant under- and overnutrition, unsustainable agricultural production systems, extreme territorial imbalances and slow transformation towards inclusiveness.

The food system remains shaped by inequities, rooted in colonialism and exacerbated by apartheid policies and the concurrent isolation of the country. This history, together with reintegration into the global food economy and the adoption of liberalisation policies shaped by the neoliberal paradigm promoted by international donors, has contributed to:



- The persistence of food and nutrition insecurity, despite the availability of sufficient food and public health interventions;
- The degradation of an already vulnerable natural environment, aggravated by the early adoption of conventional agriculture techniques, and more recently by climate change;
- The continuation of extreme wealth and income inequality arising from multidimensional poverty and unemployment shaped by former racial policies;
- Growing asymmetries in power, efficiencies and information across food value chains and spheres of governance.

Four core challenges to be overcome have been identified for the country to transition toward a sustainable food system: improved nutrition, sustainable agricultural production systems, levelling the food system playing field, and improved food system governance. To address these challenges, we proposed the following policy levers:

**In the area of food insecurity and nutrition:** Reduce the cost of nutrient-dense food, and increase the range, scale and coverage of child-centred food system interventions in the built environment;

**In the area of food production:** Support the transition towards agroecological food systems, and link land reform with place-based farmer support;

**In the area of market functioning:** Reform and enforce food system regulatory policies, and adopt an integrated approach to building an inclusive food system;

**In the area of food system governance:** Improve inclusive stakeholder participation and enhanced engagement, and adopt a two-pronged place- and issue-based approach to food system governance.

Despite the closure of both UWC and UP campuses, the majority of our laboratory-based work could be salvaged, and we were also able to continue with our in situ trials. Social science projects were also affected, and those involving fieldwork with face-to-face interviews had to be redesigned. Delays have been experienced in almost all student projects, and at least one student has de-registered due to the difficulties arising from COVID-19.

We have also engaged with the national, provincial and municipal governments concerning social grants, food parcels, food system stressors, and food safety. We increased our reach through our online CoP meetings, and published regular op-eds and articles in media platforms such as The Conversation, Business Day and Daily Maverick. We also participated in radio interviews and television, and our outputs were reported on international news services as far afield as Haiti and Argentina.

Our virtual lekgotla held in August 2021 continued to address our management response to the Mid-term Review undertaken in 2018. Our place-based approach to the analysis of food

## We continue to achieve or exceed the majority of our Service Level Agreement targets

systems has taken shape despite the COVID-19 restrictions, and we are now implementing this approach in two pilot sites, the Breede Valley Municipality (BVM) in the Western Cape and the Alfred Nzo District in the Eastern Cape. A new grant from the EU has introduced a comparative component that includes the cities of Nakuru in Kenya and Constantine in Algeria.

We can also report that once again, we received a clean audit, as we have every year since 2014. The time taken to complete agreements with researchers and transfer funds has improved significantly. The average time taken to conclude a project agreement in 2021 was three weeks; the turnaround time from the UWC legal division now sits at an average of two days.

Further highlights for 2021 are featured in the 'CoE-FS at a glance' section, on pages 8 and 9.

We can report that we continue to achieve or exceed the majority of our Service Level Agreement (SLA) targets, especially in terms of presentations at local conferences, publications in peer-reviewed journals and book chapters, and the proportion of South African women students. However, there remains a lag regarding the proportion of bursary holders who are South Africans living with disabilities.

Activities from our Communications and Engagement Strategy decreased markedly during 2021. This is attributed to the time taken to complete the recruitment of our new Communication and Engagement Manager, and we welcome Ms Carla Bernardo to our team.

However, we still publicised funded research and activities in numerous ways, including through networking and public events, our monthly newsletter, social media platforms, our website and via external media coverage. Similarly, researchers (through their various institutional departments and units) make an effort to engage with various stakeholders as part of dialogues, public forums and policy contributions. Overall, there were 74 media activities in 2021 including the use of radio, television and the national press, and 2 694 Facebook likes; and we expect a return to our previous trajectory in 2022.



**Professor Julian May**  
Director (UWC)



**Professor Lise Korsten**  
Co-director (UP)



# 2021 COE-FS AT A GLANCE

## Publications

**83 PAPERS**

IN ACCREDITED JOURNALS AND  
PEER-REVIEWED BOOKS

**36**

IN JOURNALS WITH AN IMPACT  
FACTOR GREATER THAN 3.0

**23**

AUTHORED OR CO-AUTHORED  
BY COE-FS STUDENTS

## Students

IN 2021, THE COE-FS SUPPORTED

**83 STUDENTS**

**35**

DIRECTLY FUNDED BY BURSARIES  
AWARDED FROM THE NRF GRANT

**48**

FUNDED THROUGH LEVERAGE  
FUNDING

**14**

POSTDOCTORAL  
FELLOWS IN THE  
COE-FS IN 2021

**68.7%**

WERE WOMEN  
STUDENTS (ABOVE  
THE TARGET OF 55%)

**63.9%**

WERE BLACK  
STUDENTS

**30 STUDENTS**

GRADUATED  
IN 2021

**11**

OF THESE RECEIVED  
NRF FUNDING

**19**

OF THESE RECEIVED  
LEVERAGE FUNDING

## Communication

FACEBOOK:

**2 694**

LIKES

**2 812**

FOLLOWERS

TWITTER:

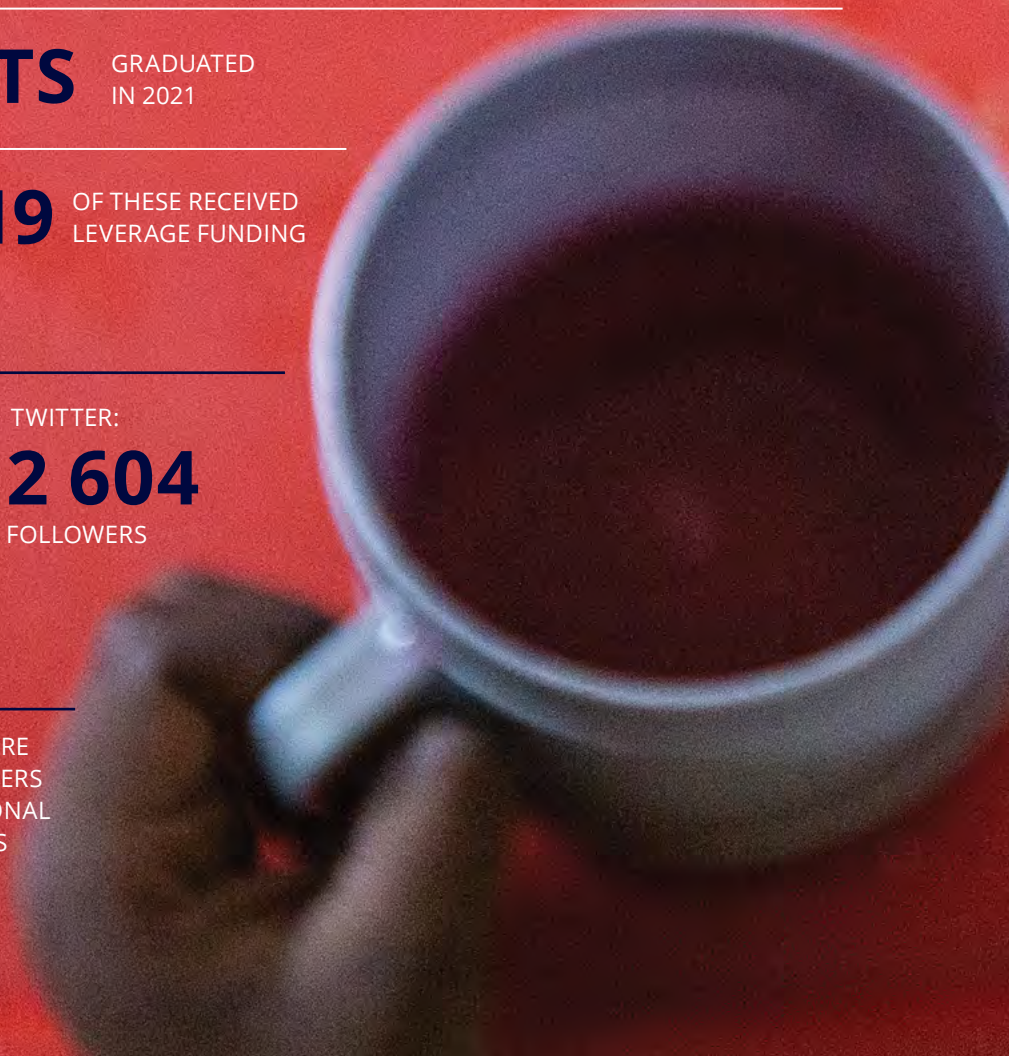
**2 604**

FOLLOWERS

## Conferences

**66**

PAPERS AND POSTERS WERE  
PRESENTED BY RESEARCHERS  
AND STUDENTS AT NATIONAL  
AND INTERNATIONAL CONFERENCES  
(MOSTLY HELD VIRTUALLY)





## CAs and MoUs

**37** COLLABORATING AGREEMENTS (CA) OR MEMORANDA OF UNDERSTANDING (MOU) WITH INSTITUTIONS/ENTITIES IN PLACE

## Researchers

**OVER 100** LEAD INVESTIGATORS/ RESEARCHERS ON THE COE-FS DATABASE

## Funding

GRANTS RAISED BY THE COE-FS IN 2021:

**R72 326 751.70**

**R28 685 569.70** IN DIRECT FUNDING

**R43 641 182.00** IN LEVERAGE FUNDING

## Specific output targets for 2021 (all achieved)

**6** MANCO MEETINGS HELD

**1** MANCO PLANNING MEETING/LEKGOTLA HELD (VIRTUAL)

**1** BUSINESS PLAN SUBMITTED

**40** NUGGETS PER YEAR HAVE BEEN PROVIDED TO THE NRF

## Research outputs

**75** ARTICLES IN REFEREED/PEER-REVIEWED JOURNALS

**4** BOOKS/ CHAPTERS IN BOOKS

**4** WORKING PAPERS/ TECHNICAL/ POLICY REPORTS

**66** REFEREED/ PEER-REVIEWED CONFERENCE OUTPUTS (PRESENTATIONS)

**78** SIGNIFICANT CONFERENCE OUTPUTS (SEMINARS, WORKSHOPS ATTENDED)

**74** RECOGNISED RESEARCH OUTPUTS (COMMUNICATION & VISIBILITY)

**11** NRF-FUNDED PROJECTS/ WORK PACKAGES SUPPORTED BY COE-FS IN 2021

**6** WERE ADMINISTERED BY AN HDI



# WHO WE ARE

## The CoE-FS

The leadership of the CoE-FS comprises a director and co-director who are responsible for the overarching management of the CoE-FS. They are supported by the Management Committee (MANCO) comprising Principal Investigators (PIs), who lead multi-year, multi-institutional programmes of research. The PIs are expected to be scientists who craft the research agenda, mediators who bridge gaps, project leaders (PL) who manage diverse teams, knowledge brokers and 'boundary spanners', and networkers assembling a CoP on specific topics of national importance.

## Director and Co-director



### Director

Professor Julian May  
UWC  
PhD  
NRF rating: C1, 2016-2021



### Co-director

Professor Lise Korsten  
UP  
PhD  
NRF rating: B2, 2013-2018

## Principal Investigators



Professor Bruno Losch  
(CIRAD/UWC)  
**Programme 1: Food systems,  
governance and policy**



Professor Naushad  
Emmambux  
**Programme 2: Innovation  
and technology**



Professor Ndiko Ludidi  
**Programme 2: Innovation  
and technology**



Dr Mmatlou Kalaba  
**Programme 2: Innovation  
and technology**



Professor Rina Swart  
**Programme 3: Nutrition,  
health and safety for food  
security**



Professor Lise Korsten  
**Programme 3: Nutrition,  
health and safety for food  
security**



Professor Julian May  
**Child Malnutrition**



Professor Stephen Devereux  
**SA-UK Bilateral Research Chair  
in Social Protection for Food  
Security in South Africa**

## Core staff



Dr Elaine Sinden  
**Research manager**



Ms Elaine Petersen  
**Finance manager**



Ms Carla Bernardo  
**Communications manager**



Mrs Robyn Engelbrecht  
**Administrative assistant**



Ms Nolutando Didiza  
**Administrative assistant**



Ms Daleen Muller  
**Administrator** (until June 2021)

## Steering Committee

In 2021, the CoE-FS Steering Committee (STEERCOM) consisted of members representing academia, civil society, and the public and private sectors.



**Co-chairperson:** Professors Jose Frantz /  
Burtram Fielding (UWC)



**Co-chairperson:** Professors Anton Stroh / Barend Erasmus / Nthabiseng Taole  
(UP). Prof Erasmus has been seconded by Professor Stroh to chair UP meetings.



**Director:**  
Professor Julian May (UWC)



**Co-director:**  
Professor Lise Korsten (UP)



**DSI representative:**  
Ms Rose Msiza



**NRF representative:**  
Dr Makobetsa Khathi / Mr Nathan Sassman



**Members:** Dr Patrick Caron (CIRAD); Ms Bongiwe Njobe (Independent consultant); Dr Joan Matji (United Nations Children's Fund (UNICEF)) – Scientific Sub-Committee Chairperson; Professor Sagadevan Mundree (University of Queensland); Professor Bocklines Bebe (Egerton University); Dr Mickey Chopra (World Bank); Professor Christine Foyer (University of Birmingham)

## Scientific Sub-Committee

The CoE-FS also established a Scientific Sub-Committee (SCICOM) in 2021 who are responsible for reviewing its planned activities, in terms of identifying what the CoE-FS should be doing, and evaluating outputs against what has been proposed in the Business Plan.



**Chairperson:**  
Dr Joan Matji (UNICEF)

**Members:** Professor Karen Hofman (University of the Witwatersrand (Wits)); Professor Nick Vink (University of Stellenbosch (SU)); Professor Joyce Tsoka Gwegweni (University of the Free State (UFS)); Dr Arlene Alpha (CIRAD)

# OUR PARTNERS

The CoE-FS has concluded formal CAs or MoUs with the following 37 institutions/entities:







According to Professor Ndiko Ludidi, the marama bean "is highly nutritious and can withstand harsh environments". The bean is especially known for its ability to tolerate droughts.



# OVERVIEW OF ACHIEVEMENTS



## Achievements related to the current stage

The tables below set out 2021's achievements against targets for 2013-2018.

### Activities related to the current stage of deliverables

Output	Achieved
Participate in official events of the CoE-FS programme.	✓
Continuously update the register of participants (including students) in the CoE-FS.	✓
Continuously update the project register that lists all research being conducted within the CoE-FS.	✓
Make available to the NRF on a quarterly basis 'nuggets' of information for publication on the CoE-FS and NRF websites.	✓
Maintain digital repository of completed research outputs funded by its resources, including theses, research reports, policy briefs and published papers.	✓
Submit a written claim with supporting documentation to trigger transfer payments each January.	✓
Submit monthly cash flow statements, within 15 days of the end of each calendar month.	✓
Collect income and expenditure reports from all collaborating partners on completion of projects.	✓
Collect income and expenditure reports from all collaborating partners on completion of the 2020 and 2021 projects that have received extensions.	✓
Submit Annual Progress Report by no later than 30 May each year.	✓
Submit an External Audit Report by no later than March each year.	✓
Submit Gate Review Documentation by no later than 27 February 2023.	To be done in 2023
Submit a Statement of Compliance by no later than March each year.	✓

### SLA 2020–2023

Description	Outputs: 2021	Output targets: 2021	Outputs: 2018–2021	Output targets: 2018–2023
Number of students supported in 2021 with CoE-FS / NRF bursaries	35	≥30	207	≥180
Students included in projects funded by the CoE-FS (all students)	83 <sup>(1)</sup>	≥60	436	≥360
Women students supported (all students)	57 (68.7%)	≥55% of all students	278	≥55% of all students
Black students supported (all students)	53 (63.9%)	≥70% of all students	272	≥70% of all students
Equity distribution of South African students (Black, Coloured, Indian, Asian) of all students	38 (45.8%)	≥80% black	250	≥80% black
	29 (35.%)	≥55% women	200	≥55% women
	0	≥4% disabled	0	≥4% disabled



Description	Outputs: 2021	Output targets: 2021	Outputs: 2018–2021	Output targets: 2018–2023
Citizen distribution of all students, both South African and non-South African	69 (83%)	≥87% South African (incl. permanent residents)	260	≥87% South African (incl. permanent residents)
	11 (13.6%)	≤5% SADC (excl. SA)	38	≤5% SADC (excl. SA)
	2 (2.4%)	≤4% of rest African continent	20	≤4% of rest African continent
	1 (1.%)	≤4% non-African	4	≤4% non-African
Proportion of students graduating by the next Gate Review	To be determined in 2023	≥75% of all students since inception		≥75% of all students since inception
Average duration of submission of master's degrees (post honours)	24 months	≤24 months	24 months	≤24 months
Average duration of submission of PhD degrees	36 months	≤40 months	36 months	≤40 months
Average duration of submission of PhD degrees (upgraded from master's)	60 months	≤60 months	60 months	≤60 months
Postdoctoral fellows	14 (16.7%)	≥10% of students	47	≥10% of students
Number of unrated researchers who become rated, or rated researchers who retain or improve their rating	11 <sup>[2]</sup>	≥3–4	11	≥20
Number of patents, products and artefacts	1	≥2	3	≥10
Number of articles accredited journals, chapters in peer-reviewed books or books	83 <sup>[3]</sup>	≥27	238	≥160
Number of articles with an Impact Factor greater than 3	36	≥32	81	≥32
Number of joint venture student training initiatives	4	≥10	31	≥10
Number of local conferences organised	0	≥2	12	≥2
Number of international conferences organised	0	≥2	3	≥2
Presentations at local conferences (virtual)	46 <sup>[4]</sup>	≥160	229	≥160
Presentations at international conferences (virtual)	20 <sup>[5]</sup>	≥40	74	≥40
Food security panels organised at conferences	0	≥1	19	≥4
Annual social media (Facebook, etc.) views	7 974 <sup>[6]</sup>	≥37	21 770	≥222
Number of face-to-face policymaker engagements	0	≥6–7	27	≥40

Description	Outputs: 2021	Output targets: 2021	Outputs: 2018–2021	Output targets: 2018–2023
Annual website views	278 <sup>[7]</sup>	≥750	41 368	≥4 500
Annual media activities (radio, TV, press)	74	≥2	906	≥12
Annual Facebook likes	2 694	≥16–17	6 731	≥100
Number of citations of pooled articles/book chapters that acknowledge CoE-FS funding (Google scholar)	37	≥6–7	129	≥40
Additional funds raised	R72.3 million	≥R17 million	R124.9 million	≥R100 million

[1] This figure includes 35 NRF and 48 leverage-funded students.

[2] 11 researchers retained their rating.

[3] A total of 23 students authored / co-authored the publications.

[4] Due to COVID-19, no one-on-one local conferences have been held since March 2020; these have been replaced by webinars / online meetings.



[5] Due to COVID-19, no one-on-one local conferences have been held since March 2020; these have been replaced by webinars / online meetings.

[6] This figure includes the Facebook group, Facebook page, Twitter account, YouTube views and SoundCloud listens.





[7] Due to security breaches, not all website views could be located.

## Transformation targets

(Further information on transformation can be found under 'Transformation', on pages 18 and 19)

Output	Achieved
At least five senior academics from formerly disadvantaged groups have experienced further capacity development	
At least 15 emerging academics from formally disadvantaged groups have experienced capacity development	

## Specific output targets

Output	Achieved
Six MANCO meetings have been held	
One MANCO planning meeting / Lekgotla has been held (virtual)	
Annual Business Plan was submitted	
40 nuggets per year have been provided to the NRF	

# TRANSFORMATION

**The collaborative nature of the CoE-FS's projects provides unique opportunities for capacity development within and between collaborating partners. The CoE FS's MANCO, as well as the PIs and researchers, includes colleagues from previously disadvantaged groups. In addition to developing the capacity of senior and emerging researchers, the CoE-FS also encourages its staff and students to strengthen their individual skills.**

Ms Elaine Petersen's role developed from a finance administrative role into a coordinating role; the benefits of staff rebates assisted her with building her knowledge and skills in this specific field. The skills and knowledge she gained enabled her to make better strategic decisions and apply the knowledge learned. The projects increased her knowledge of the various funding instruments. She has also completed various in-house finance and human resources training courses, and successfully completed her BCom General Degree (finance stream) in 2021. She is now registered for an honours degree in this field, and plans to complete it in 2022.

Ms Robyn Engelbrecht, who was appointed on a six-month contract as an administrative assistant, obtained a certificate in Economic Development from UWC in 2021.

Ms Nolutando Didiza is currently enrolled in an honours programme at the ISD at UWC, and also completed various in-house training courses in the university's Finance and Human Resources departments.

Dr Elaine Sinden is currently supervising three master's students enrolled at the ISD at UWC. One student's thesis is currently being edited. She has also published an article in the *Women Studies Journal*, and drafted a research report, 'Adopting spatial planning and territorial approaches to food systems and food and nutrition security: A review of policy responses in South Africa', as part of an EU/FAO project.

Professor Ndiko Ludidi received a Fulbright Visiting Research Scholar award to be at MU to investigate drought and heat stress responses in pearl millet and finger millet using proteomics, with the aim of translating the data to improve tolerance of maize to these stresses. The award is for a seven-month research visit (November 2021 to May 2022) to conduct the research at the College of Agriculture, Food and Natural Resources at MU, in collaboration with Professor Scott Peck and Professor Robert Sharp, who are part of the Interdisciplinary Plant Group at MU.

Professor Naushad Emmambux was promoted to full professor in January 2020, and delivered an inaugural address on 7 September 2021.

Professor Marshall Keyster from the Department of Biotechnology at UWC has been selected as one of 40 mentors in the ARUA UKRI GCRF FSNet-Africa fellowship programme. 20 early-career researchers from 10 academic partner institutions in six African countries (Ghana, Kenya, Malawi,

South Africa, Tanzania and Zambia) will conduct multi-, inter-, and transdisciplinary research focused on the transformation of African food systems.

## Gender impact

The CoE-FS has made a concerted effort to include women in its research teams and as recipients of student bursaries; currently, 57 of the 83 students (68.7%) are women.

With respect to the CoE-FS management and administrative teams, currently the co-director, research manager, finance manager, communications manager, and two administrative assistant positions are filled by women.

One of the three project team members of the Local Food Governance project is a woman. In addition, several of the collaborating academics are women, and a significant proportion of the participants in the Food Governance CoP workshops were women.

Of the 18 students in Professor Ndiko Ludidi's project, 11 are women. Opportunities for them to participate in workshops, seminars, conferences and training courses are continually being sought in order to enhance their career prospects.

The majority (73%) of the collaborators on research projects conducted as part of Nutrition and Health are women, as are the majority (77%) of CoE-FS-funded students and leverage/non-funded students. From one of the leverage projects, a paper on gender, food consumption and food procurement has been prepared. This publication is part of the special edition which is under review by the *Public Health Nutrition* journal.

## Transformation goals

The CoE-FS has made a concerted effort to promote its transformation goals (transdisciplinary, multi-institutional research, promotion of designated groups, internationalisation), and a few examples are listed below:

In our pursuit of a more equitable, just and sustainable society, we must examine not only who is empowered to make decisions, but also on whose evidence these decisions are made. The question of whose knowledge is to be recognised, translated and incorporated into action is particularly important in South Africa, in the context of decolonising knowledge and our universities. The approach of knowledge co-production through CoP, workshops and co-elaborative scenarios is inherently transformative, as it facilitates groups otherwise marginalised in knowledge production (women, small farmers, informal workers, refugees); these groups were not only considered, but helped to inform the overarching research agenda and had their knowledge integrated into the co-production process.





In the past year, we have also focused our research on marginalised groups within the food system that we argue should have a more central role in food governance, namely informal food traders and civil society organisations. The approach of knowledge co-production is also inherently transdisciplinary, as it includes not only researchers from multiple academic disciplines, but also participants from outside of science.

All students in the project led by Professor Ndiko Ludidi are black except one white woman. This project promotes transdisciplinary research by bridging plant science with animal science, and is working towards the inclusion of indigenous knowledge systems from a social sciences point of view to address mainstreaming of indigenous grain crops in the South African food system. All collaborations with international institutions contribute to internationalisation of the research work done in the project.

In addition to the black male international PhD candidate, Mr Mandla Sibiyi, a South African white woman, Miss Angelique de Wet, has joined the team led by Professor Jacquie de Waals and is actively involved in the project. Mr Knowledge Mushonga (black male PhD candidate) was also a key member of the team, involved in the assessment of soil health indicators over time.

The collaboration between UP's Department of Plant and Soil Sciences and the Food Science Department of the UFS directly

**In our pursuit of a more equitable, just and sustainable society, we must examine not only who is empowered to make decisions, but also on whose evidence these decisions are made.**

contributes to the transdisciplinary and multi-institutional research goals of the CoE-FS.

All projects within the Nutrition and Health project embrace internationalisation and actively engage with international collaborators in Africa and the global north. The Gut Microbiome project is currently in the process of preparing an EU Horizon proposal with a multitude of collaborators from African and European countries. Similarly, the leverage-funded food environment projects have collaborators in the USA, Chile, Mexico, Colombia, Jamaica, Peru and Brazil, with advisors in the UK, New Zealand and Thailand. All collaborators meet at least twice a year for the equivalent of three-day conferences, and have monthly webinars and discussion groups on thematic topics. Where possible, students are enabled to attend these discussions. All but two of the students of the Nutrition and Health CoE-FS-funded students are from designated groups, and most are women.



# FINANCIALS



## Funding received and spent from NRF in the reporting period

### COMMITMENT

**R16 636 920.77**

### EXPENDITURE

**R12 539 872.78**

The unspent balance of R4 097 047.99 is made up of R796 047.99 committed funds and R3 301 000.00 in unallocated bursary funds. The unallocated bursary funds were a result of new bursaries being funded by HICD, and of postdoctoral fellows not taking up their fellowships that were budgeted for in 2021.

The remaining R796 047.99 in committed funds consists of 20% project balances and running costs, which will be fully expended during the first half of 2022. The unallocated bursary funds will be used to fund postdoctoral fellows for one year, and also to support human capital development.

We request that the amount of R4 097 047.99 be rolled forward into 2022.

## Breakdown of NRF funding expenditure

Commitment	Budget	Spent	% Budget
Running costs 2020 B/F	R1 321 542.02	R1 321 542.02	100.00%
Research	R4 814 000.00	R4 042 400.00	31.43%
Bursaries	R6 640 000.00	R3 339 000.00	43.36%
Salaries	R3 338 610.00	R3 338 610.00	21.80%
Running costs (operational)	R286 273.00	R261 825.01	1.87%
Conferences, webinars and media	R236 495.75	R236 495.75	1.54%
Equipment	R0.00	R0.00	0.00%
<b>Total income</b>	<b>R16 636 920.77</b>	<b>R12 539 872.78</b>	<b>100.00%</b>

## Direct\* and leverage funds (funding received by PIs/PLs)

The CoE-FS has managed to raise a total of R72 326 751.70 in additional funding. This amount is made up of R28 685 569.70 in direct funding and R43 641 182.00 in leverage funding.

\*Any financial contribution to the project, other than the funding received from the CoE-FS, which is auditable and managed by the PL and the collaborating institution.

## Return on investment

The CoE-FS publication list and students registered for 2021 represent a significant return on investments, and once the published output has been verified and converted into subsidy income, this will represent considerable income for the universities where the research is taking place.

It is difficult to accurately estimate the value of the expenditure in terms of subsidy income, since this varies year on year and is affected by the number and location of co-authors. Since its inception in 2014, the CoE-FS has published over 350 journal articles, book chapters and books, with the highest cumulative citation of 55. It has also supported more than 350 students, which is viewed as a long-term economic and societal investment.

The establishment of the CoE-FS has also resulted in considerable additional funding in 2021, amounting to R72 326 751.70. However, the greatest return on investment is the networking and collaborations that have taken place within the projects supported by the CoE-FS, and the findings that are emerging. As mentioned, the CoE-FS currently has 37 CAs in place, with more than 100 international and national collaborators since 2014.



# SOCIAL IMPACT

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The CoE-FS has made a concerted effort to advance social impact. Most of the activities are described in the projects and KPAs, but a few additional examples of such interactions are listed below:



The social impact of **the Local Food Governance project** increased strongly during 2020/21 due to the engagement of the Food Governance CoP with a wider group of stakeholders, including civil society but also local government. More frequent meetings, higher numbers of participants and live screenings of the meetings on Facebook have dramatically increased the reach of the CoP (up to 100 online participants, and more than 300 followers on social media). In addition, the research on civil society engagement in food governance interviewed over 50 civil society representatives, and the results were presented to local and provincial government. This provided an opportunity to communicate the needs and views of marginalised governance stakeholders to government, at a time when – due to the pandemic – key government officials and institutions were more appreciative of the need to work with civil society organisations and the informal sector.



**The research** led by Dr Marc Wegerif includes civil society, including the East and Southern African Farmers Forum, the Masifundise Artisanal Fishers Organisation (South Africa), the Association for Rural Advancement (South Africa), the Environmental and Management and Economic Development Organisation (Tanzania), and the Network for Women's Rights in Ghana. They have also interacted and shared information with SAITA and the Women in Informal Employment: Globalising and Organising network.



The **SMART foods project** is working with social scientists who specialise in 'Augmentative and Alternative Communication', and has published a paper on food and nutrition security for people with disabilities. We are also working with a social scientist on two papers, on (i) relating properties of indigenous porridge for baby foods and policy impact, and (ii) why the marama plant should be domesticated. The traditional food crops are mainly grown by smallholder farmers; this research will have a major socioeconomic impact on rural societies through value addition. This will contribute to the government's effort to end hunger and poverty, and ensure food security for vulnerable rural households. Honours students from UP attended the SAAFFI Flavour Seminar, an important platform for meeting potential employers and for assisting students with Food Product Development projects.



As a result of their **engagement with smallholder farmers**, the project led by Professor Ndiko Ludidi led to the adoption of regenerative agriculture practices that have increased yields while preserving natural resources (using less water and reducing environmental impact) for a smallholder farmer cooperative in the Eastern Cape named Di Farms.



The project led by Professor Marshall Keyster started a **community engagement project** with a community in Matatiele, Eastern Cape. It will explore possibilities for converting land into farming land for subsistence farming. The team also started a community engagement project in Mthatha, Eastern Cape. This project aims to provide vegetables to the community, with the possibility of converting the excess produce into cash by selling at local markets. They are also working with a community in the Westbank area of Cape Town, assisting the community with farming vegetables. The team will be conducting ICP analysis on the surrounding soils in order to assess the appropriateness of the soil for vegetable farming. Professor Jacquie de Waals and her team will ensure that results are presented at industry and grower days, and published in lay magazines, to ensure effective technology transfer of the results and thus increase the social impact of the project.





As a result of a partnership with UP's drama department (School of Arts), the findings of a food safety project could be further disseminated to the public in the form of **an interactive play** that involved the participation of five drama students (Teana Chiba, Manqoba Sithole, Abulele Petersen, Kirsten Dickinson and Bongwiwe Jiyane). The 40-minute play was directed by Professor Marié Heleen Coetzee and choreographed by Ms Kristina Johnstone and the cast. UP wardrobe manager Nomzamo Maseko designed costumes for the play.

The applied theatre programme, *Auntie Covidia and the Curious Calamities*, was aimed at adult women and focused on the appropriate use of hand sanitisers during the COVID-19 pandemic. The play addressed mask-wearing, social distancing, the importance of reading hand sanitiser labels, toxic substances in hand sanitisers, low-quality sanitisers and the development of skin allergies as a result of hand sanitiser use. It also focused on debunking myths surrounding the COVID-19 vaccine. The performance took place from 17 to 19 May 2021 at Moja Gabedi in Hatfield, Pretoria. Moja Gabedi is a UP-owned outreach project that is managed by the UP Partnerships in Progress initiative. Over the three-day period, the play was performed (free of charge) to approximately 110 people from the following organisations: Suikerbakkies Early Childhood Centre, SOS Children's Village, Entozweni Early Childhood Centre, Goodhope Centre Creche, Cuddle Bunnies, Community Orientated Substance Use Programme, and Circle of Life. The programme involved a live show with transmedia extensions and participatory audience engagement in small groups after the show. The play was filmed, and the online version includes parts of the live show, as well as different pre-recorded shots.





# SCIENTIFIC CONTRIBUTION

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**The world faces many challenges to food security, including undernutrition and overconsumption, rising food prices, population growth, and threats to agricultural production. In addition to causing widespread human suffering, food insecurity contributes to the degradation and depletion of natural resources and economic instability.**

The growing threat of global climate change, for instance, amplifies the need for food systems to better meet human needs and align with planetary resources. The work of Professor Ndiko Ludidi and his team plays an essential role in meeting the global challenge of moving the world into a safe operating space in which agriculture can meet global food needs. A research group on the microbiology of food plants in the context of climate change has been established in the Faculty of Science, following a UWC and Missouri University Plant Science Symposium held in 2015. This group have re-focused part of their work on indigenous grains and legumes, and undertaken seed collection visits in remote areas of the Northern Cape and Limpopo. The CoE-FS has also funded research on food authenticity using DNA metabarcoding.

Work on public nutrition in the Faculty of Community and Health Sciences at UWC has also expanded, with a growing focus on obesogenic food environments and diet-related non-communicable diseases. Studies have also been undertaken on the specific nutritional needs of highly vulnerable groups, including waste-pickers, people living with HIV/AIDS, and students. The Department of Dietetics and Nutrition is one of five departments in South Africa offering a degree in this field.

The FAO-EU-funded initiative on comparative food-system assessments has helped to reinitiate the discussion about the implementation of the National Food and Security Plan 2017-2022. The initiative coincided with the UNFSS National Dialogues organised by the DALRRD in June and July 2021, in which programme members participated. The National Food Governance project team was invited to present its preliminary results at the National Dialogues Pathways meeting organised by DALRRD on 26 August 2021, and was also invited to participate in the DALRRD UNFSS follow-up Steering Committee meeting on 4 November 2021. This activity has positioned the CoE-FS as an active contributor to the policy debate, recognised

by the DALRRD and by the Coordinating Committee for Food and Nutrition Security at the Presidency (DPME).

The multi-stakeholder engagements organised with the Food Systems Imbizos also contribute to consolidating the role of the CoE-FS – as a facilitator of dialogues with universities, policymakers, civil society, and the private sector, including the informal sector – already developed by the CoP of the Local Governance project. In parallel, the restarting of the #FoodTalks@UP seminars contributes to raising awareness of food-related issues for a large audience.

Inputs were made into the World Committee on Food Security Civil Society Mechanism processes of engagement around the UNFSS held in September 2021. These included inputs on the planning processes and the content of some of the positions. Several outputs from the Researching the Obesogenic Food Environment (ROFE) and HPL study are being used in the City of Cape Town projects. One example is the geolocation of food retail stores in Langa. Another is the ROFE information that has been used as part of CoP activities within the Food Governance programme.

The project led by Professor Marshall Keyster disseminates the ICP results to the farming community in the Eastern Cape, which could aid in better soil management and planning for the 2022 growing season. This team is also working closely with GSA in order to reach more small-scale farmers in the broader crop-growing areas of South Africa. This project will write an information brochure to assist farmers with soil ICP data, as well as pathogen incidence across field sites.

**Studies have also been undertaken on the specific nutritional needs of highly vulnerable groups, including waste-pickers, people living with HIV/AIDS, and students.**





# KEY PERFORMANCE AREA 1:

# RESEARCH

The CoE-FS undertakes research, capacity building, multi-stakeholder dialogue and policy advocacy on how sustainable food systems can achieve food and nutrition security for all. The objective of this work is to improve people's nutritional status by linking innovative science with critical inquiry and implementation strategies. Three areas of work are prioritised, as follows: (i) multi-level governance and policy dialogues to create a sound and resilient food system at global, national and local level; (ii) innovation for the sustainability, productivity and utilisation of indigenous African and other locally available foods that affect food security; and (iii) quantity, quality, diversity and safety of diets in relation to all forms of malnutrition.

Cross-cutting themes are a humanities perspective to explore the complex, dynamic and diverse relationships between food and human beings; a food systems perspective; addressing the complexities of the production, processing, marketing, distribution and consumption of food, with consideration for the environmental impacts of the food system; and a social protection and poverty reduction perspective, concerned with the causes and consequences of – and solutions to – multiple deprivations.

The six areas of research adopted and endorsed by the STEERCOM in 2015, and approved by the NRF in 2016, remained the focus of our work in 2021. However, these have been

re-aligned based on the outcomes of the May 2019 Lekgotla. The objectives now are to further integrate the research of the CoE-FS, also taking into consideration our mid-term review.

The three research questions that inform the scope of work for the CoE-FS's research activities for the second planning cycle (2020-2024) remain unchanged. These are:

1. How is the global and national food system changing, and how does this affect the sustainability, availability and attributes of and access to food?
2. Who are the 'food insecure', where are they located, what are their choices, strategies, and opportunities when seeking food security, health and well-being, and how are these changing in response to the changing food system?
3. What policies, technologies, interventions and products enable access to affordable, nutritious, safe food in ecologically, economically, socially and politically sustainable ways?

In 2021, the CoE-FS retained its Pls, who were drawn from the two host institutions and consortium partners based on their relative strengths. These Pls make up the CoE-FS's MANCO. The research programme of the CoE-FS is undertaken as projects within multidisciplinary programmes, synthesised at the core through transdisciplinary analysis.





## PROGRAMME 1

# FOOD SYSTEMS, GOVERNANCE AND POLICY





This programme is led by Professor Bruno Losch (CIRAD/UWC). South Africa's agrofood system is undergoing rapid, corporate-driven restructuring with both direct and indirect implications for food security. In 2021, this programme sought to explore the most urgent and important changes to South Africa's agrofood system, driven by corporate restructuring that has both direct and indirect applications for food security. The study continues to explore the nature of these changes in both the local and Southern African food systems, the drivers of that change, and the main determinants and outcomes.

A second major set of problems concerned the institutional arrangements for food system governance at city level, as well as the alignment between regional development priorities and the need for food security and a right-to-food policy.

Programme highlights are as follows.

## Local food governance

(Project ID: 21101)

This project involves Dr Camilla Adelle (Governance Innovation [GovInn], UP) and Mr Florian Kroll (UWC). The project adopts an action research approach, engaging directly with the transformation of local governance by generating knowledge to inform practice, and studying governance practice to expand and deepen knowledge in local food governance. The main activities of this project in 2021 were:

- Food charters and civil society engagement, using leverage funding from the Cape Higher Education Consortium (CHEC) Western Cape Government (WCG) to research and publish a CoE-FS Working Paper on 'Engaging civil society organisations in food security governance in the Western Cape: Reflections from emergency food relief during COVID-19'.
- The Food Governance Communities of Practice (CoPs): The CoPs (Gauteng and Western Cape) continued to gather in combined online meetings in 2021, boosted by leverage funding from the CHEC WCG. This facilitated a series of meetings on the impacts of COVID-19 on the local food system, as well as the publication of three policy briefs and an infographic.
- Informal trade: Using leverage funding, a food relief intervention study was carried out to assess the capacity of informal traders to provide access to food in return for SMS-based vouchers, and to disseminate information about COVID-19. A policy brief on informal trade governance was developed.

Research under this project will continue in 2022.

## National food governance – Towards national knowledge brokerage

(Project ID: 21102)

This project involves Dr Camilla Adele (UP, GovInn), Mr Florian Kroll (UWC), Professor Lise Korsten (UP), Dr Marc Wegerif (UP), Professor Julian May (UWC) and Professor Bruno Losch (UWC/CIRAD). This project sought to develop knowledge brokerage platforms for identifying ways to improve the governance of South Africa's food system.

The main activities under this project in 2021 were:

- Research on food safety and the implementation of food safety policies.
- Research on national food governance to determine if existing arrangements support the reduction of food security in South Africa.
- Food safety governance master's and PhD students looking at the management and implementation of food safety policies.
- Focusing on national food governance, leverage funding provided by the United Nations Food and Agriculture Organisation (FAO) and the European Commission was used to implement the CoE-FS's Rapid Food System Assessment of South Africa.

Research under this project will continue in 2022.

## Maximising access to a balanced, safe and healthy diet for the poorest urban residents

(Project ID: 21103)

This research is led by Dr Marc Wegerif (UP). This study looks at the production and distribution of fresh produce – particularly high-protein foods such as groundnuts and cabbage – by urban informal food traders to the urban centres of Johannesburg and Pretoria. The impact on small-scale and black farmers is

explored, as is the level and nature of food safety hazards. The study highlights the need for greater understanding of street traders so as to improve planning, regulations and relations with authorities. Research on this project will continue in 2022.

## A place-based approach in selected municipalities

(Project ID/ – 21104)

This research was led by Professor Julian May (UWC), and includes Professor Bruno Losch (UWC), Professor Peter Verberg (VU-A), Dr Jacqueline Davis (VU-A), Dr Michelle Eichinger (VU-A), Mr Ashley Haywood (UWC), Professor Jane Battersby Lennard (UCT), Professor Scott Drimie (SU/Southern Africa Food Laboratory (SAFL)). First proposed at the 2019 Lekgotla, its inception was postponed to 2021 due to funding constraints. The project applies methods that draw on the territorial approach to development. It also builds on collaborations developed in 2018/19 with the South African Local Government Association (SALGA) and with local municipalities in the Cape Winelands District of the Western Cape, the LEAP-Agri-funded projects currently being implemented by the CoE-FS, and ongoing work in the Johannesburg and Cape Town metropolises. It incorporates data collected by Food4Cities in Worcester, Nouricity in Mount Frere in the Eastern Cape, and Langa in the Cape Town metro. The CoE-FS project 'Balanced and Healthy Diets for the Urban Poor' collected data in the Johannesburg

metro. The project also builds on previous research undertaken by the CoE-FS in the Umzimvubu Local Municipality as part of the PURE Project, funded from 2014 to 2018. In 2021, new collaborations were initiated in the Matatiele Local Municipality, reported on under Project 2.2 (Climate Smart Regenerative Agriculture) in Programme 2 on Innovation. This work has been supported by over R4.8 million in leverage funding raised from LEAP-Agri and from CHEC for the period 2019 to 2021, and the Project now comprises five WPs.

The project was planned to be implemented in the second phase of the CoE-FS (2020-2024), and is based on ongoing engagement with the Witzenberg, BVM, Alfred Nzo municipalities and communities, and SALGA and the WCG. Work has been severely affected by COVID-19 mitigation measures, and research will continue into 2022.

PhD researcher Mr Ashley Haywood is completing his fieldwork on this research project.



PROGRAMME 2

# INNOVATION AND TECHNOLOGY



The PIs for this programme are Professors Naushad Emmambux (UP) and Ndiko Ludidi (UWC), and Dr Mmatlou Kalaba (UP). The programme investigates organisational and technological innovation in food systems, particularly in food production and processing. The focus is on the activities of small- and medium-size farm and non-farm enterprises, rather than on subsistence or micro-enterprises. The highlights of the programme are:

## SMART Food processing

(Project ID: 21102)

This project is led by Professor Naushad Emmambux (UP).

The team includes Professor Kwaku Gyebi Duodu (UP), Dr Nwabisa Mehlomakulu (UP), Dr Danie Jordaan (UP), Professor Elna Buys (UP), Dr Maboko Mphosi (UL), Professor Riëtte de Kock (UP), Professor Shakila Dada (UP), Dr P. Dlamini (UL), and Professor Eric Amonsou (Durban University of Technology (DUT)). The project focuses on the kinds of technological innovation in indigenous and local foods that would improve food and nutrition security. This project works hand in hand with the agricultural production part of the programme.

The primary objectives of the proposed project are the creation and processing of 'SMART' foods and food ingredients from indigenous and local plants; the development of food processing technologies that would allow for the production of affordable, safe, convenient, consumer-driven, nutritious foods and food ingredients; and value addition to waste for sustainable food production.

Studies have explored technological innovations that could:

- Reduce the energy density of foods, looking at the use of maize starch and sorghum meal.
- Increase the nutrient density of foods, with potential health benefits for both infants and adults; studies are focused on Bambara groundnut, cowpea seeds, sorghum porridges, a crude extract from *Carica papaya* peel, and maize and rice starches.
- Add value to agro-food industry waste, for example through the use of indigenous South African plant species as sources of natural food colourants, and cellulose extracted from cowpea. Other studies are looking at the potential of marula kernel material, derived from the marula value chain, as a source of protein.

In addition, the Limpopo Agro-Food Technology Station trained some food processors in good manufacturing practices. A manual for the manufacturing of a solar dryer was adopted for low-literacy users and published, as well as being translated into other languages.

## Innovation for environmental change-resilient agriculture drought responses in cereals and legumes

(Project ID: 21202)

Professor Ndiko Ludidi (UWC) is leading this project. Other team members include Professor Hon-Ming Lam (Chinese University of Hong Kong, China), Professor Robert Sharp (MU, USA), Dr Ifeanyi Egbichi (Walter Sisulu University), Professor Marshall Keyster (UWC), Dr Mounawer Badri (Centre of Biotechnology of Borj Cedria, Tunisia), Dr Nandipha Ndudane and Dr John Lisa (Tsolo Agricultural and Rural Development Institute, South Africa), Professor You-Zhi Li (Guangxi University), Professor Yu Takahashi (Japan International Research Centre for Agricultural Sciences), and Dr Alina Mofokeng (ARC).

Through a host of technological innovations, the project aims to prevent the negative impact of drought and heat stress on food and nutrition security, while improving soil health and reducing excessive use of limited water resources. At the same time, means will be identified to improve soil health, while increasing the biodiversity of insects and the soil microbiome, which will benefit crop production.

This project consists of various WPs, and the main activities in 2021 included:

1. The valuation of maize, sorghum, soybean, wild sweetpea, pigeon pea, finger millet, and pearl millet under both drought and heat stress conditions. Studies were conducted under field conditions in the Alfred Nzo District Municipality in the Eastern Cape, where land has been made available to the CoE-FS as a result of community engagement/community service rendering to small-scale farmers in the municipality.
2. The development of a breeding programme for soybean, to develop new soybean cultivars with enhanced tolerance to drought.
3. The use of regenerative agriculture practices, using crop rotation, intercropping and minimal soil-disturbance techniques in the production of maize, soybean, sorghum, cowpea, wheat, barley, pearl millet, finger millet and marama, among many other crops.
4. Building on a 2020 study to look at the impact of low-methane-emission livestock feeds on an average daily gain in cattle, sheep, and goats. Delays with ethics clearance mean that this project will continue into 2022.



## Reclamation of heavy metal contamination of soils

(Project ID: 21202 – WP 2.2.2 (1))

Professor Marshall Keyster (UWC) is leading this research with Professor Ndiko Ludidi (UWC) and Dr Donna Brandt (MU). The purpose of the project was to analyse soil for nutrient status, physical properties, chemical properties, biological properties and microbial diversity, before and during the course of cultivation of crops. In addition, the soil was analysed for microbial diversity to identify bacteria that could promote plant growth.

The objectives and activities under this project in 2021 included:

1. Soil analysis, using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) on soil samples from various sites earmarked for field trials.
2. Various extreme weeds were identified and GPS-tagged on sites around UWC, the broader Cape Town area and coastal areas, with the aim of screening endophytes for impacts on seed germination as well as overall seedling growth.
3. Bacterial candidates will be used in plant growth experiments conducted in both field and greenhouse experiments. Important findings were made regarding the survival of Common Bean and Alfalfa crops growing in a field in Lukholwini in the Eastern Cape, using a consortium developed in this project.

## Crop rotation sequences and soil health in SA

(Project ID: 20202 – WP 2.2.5)

This project was led by Professor Jacquié van der Waals (UP). The objectives and activities in 2021 were:

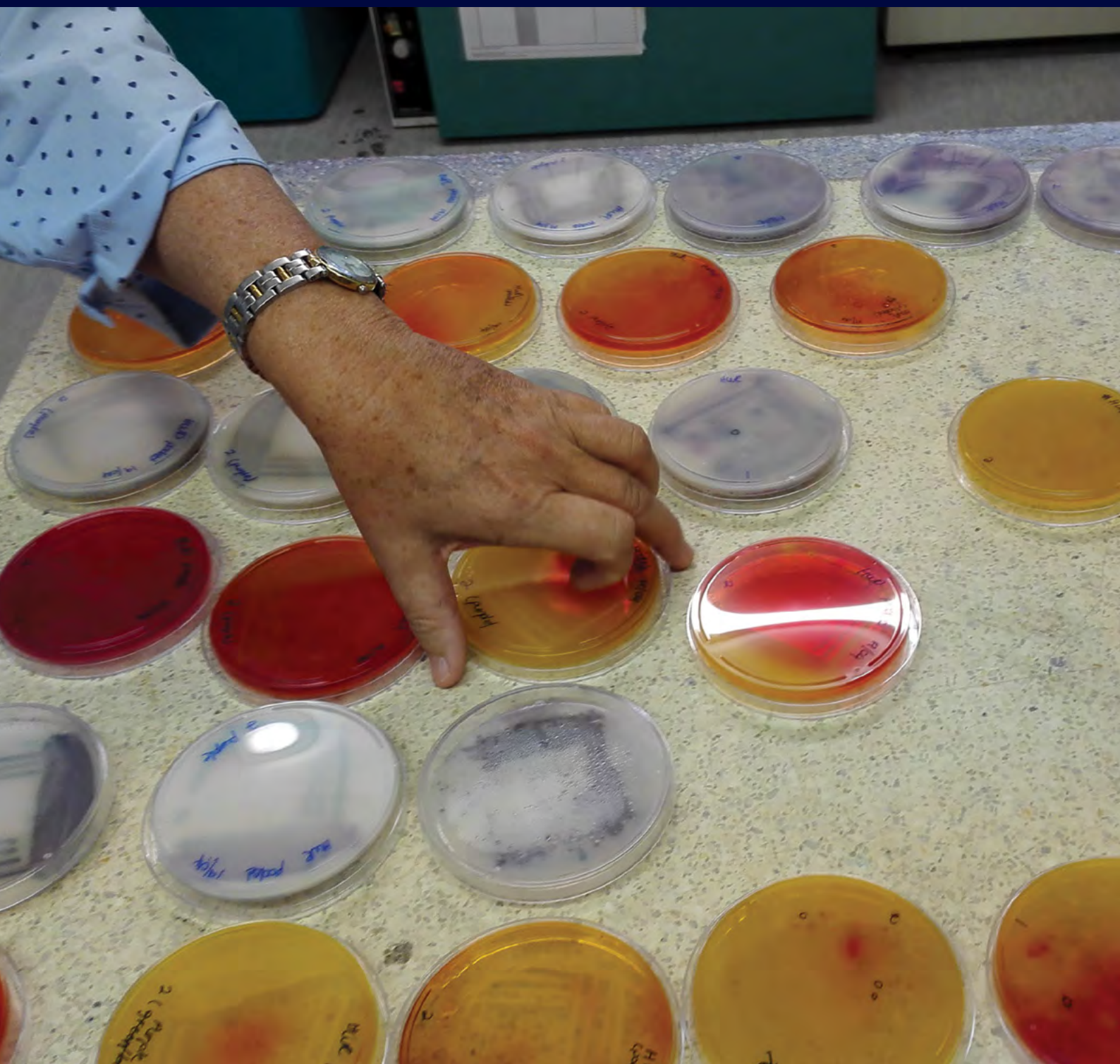
1. To determine the impacts of selected crop rotation sequences on soil health through specific soil health indicators, using a case study in the eastern Free State.
2. To develop and optimise a seedling bioassay to measure pathogen status in selected crop rotation sequences as a means to evaluate the soil-borne pathogen build-up, using a long-term crop rotation trial in the eastern Free State as a case study.
3. To identify the most sensitive soil health indicators for developing a conceptual soil health protocol for the eastern Free State long-term crop rotation trial.
4. To evaluate selected soil health indicators to develop a region-specific rotation sequence. The data below consist of selected soil health indicators that were assessed in the Free State long-term crop rotation trial, from 2019 to 2021. The preliminary data generated is expected to form the foundation to assessing soil health changes over time.

### Crop rotation treatments in the long-term eastern Free State trial

Year	Growing season	Rotation system number			
		1	2	3	4
0	2015 / 16	Potatoes	Potatoes	Potatoes	Potatoes
1	2016 / 17	Maize	Maize	Maize	Maize
2	2017 / 18	Maize	Sugar beans	Soybeans	Sunflower
3	2018 / 19	Teff	Maize	Maize	Maize
4	2019 / 20	Fallow	Fallow	Fallow	Fallow
5	2020 / 21	Potatoes	Potatoes	Potatoes	Potatoes

## PROGRAMME 3

# NUTRITION, HEALTH AND SAFETY FOR FOOD SECURITY





The PIs for this programme are Professors Rina Swart (UWC) and Lise Korsten (UP). The question ‘What is on the plates of South African consumers?’ has been the central focus of this programme. Over the 2020-2024 cycle, the spectrum of research has included the continuation of the exploration of food consumption patterns, paying special attention to particularly vulnerable groups where possible; the safety of the food on the plate; possible effects (on nutrition and health) of appropriate, affordable and accessible interventions to improve the amount and quality of food on the plate; and the interaction between and impact of changing food systems in the country on the content of the ‘plate’, and subsequent consequences for the nutrition and health of the population.

Research was conducted under the following WPs:

## Safe food

(Project ID: 20301)

This project is led by Professor Korsten (UP). Team members include Dr Erika du Plessis (UP) from June 2021, Dr Stacey Duvenage (UP) from January to June 2021 (University of Greenwich, United Kingdom), Dr Chris Marufu (UP), Dr Ishmael Jaja (UFH), Professor Kalmia Kniel (UD), Professor Shirley Micallef (UMD), and Dr Manan Sharma (US Department of Agriculture’s Agricultural Research Services).

The objectives, activities and highlights under this project in 2021 included:

1. **All-inclusive One Health risk analysis for community health**, linking research conducted under the original CoE-FS Food Security project on Food Safety; a next-phase project facet focusing on re-emerging pathogens; and a final stage of the third-year programme looking at emerging threats to ‘One Health’. Pathogens which have been identified included *Salmonella spp.* and *Escherichia coli* as major pathogens prevalent in the environment and informal food system, associated with fresh produce, especially leafy green vegetables.
2. **Risk reduction through innovation**, with the aim of decreasing the load of pathogens in irrigation water by pre-treatment. Ms Nombulelo Mbamba successfully defended her MSc project, titled ‘The efficacy of Moringa oleifera-zero valent iron sand filtration on the reduction of *Escherichia coli* in borehole water for the irrigation of spinach’, with other studies ongoing.
3. **Risk mitigation, communication and education**, which aims to raise awareness and education of consumers and food handlers. A hand sanitiser project resulted in 17 popular articles. An applied theatre programme (interactive play) called *Auntie Covidia and the Curious Calamities* was developed, aimed at adult women and focused on the appropriate use of hand sanitisers during the COVID-19 pandemic.
4. **Assessing the microbiota of fresh fruit and vegetables and how they affect the gut microflora of selected communities**, work that forms part of a multi-pronged research approach in the Plant Pathology and Food Safety groups at UP that aims to understand the preventable disease burden of potentially unsafe food and poor-quality diets. There are currently numerous research projects (MSc, PhD, postdoc) that have investigated food products and practices, and the level of community exposure that can contribute to poor food quality and safety. So, for example, MSc student Ms Nondumiso Cebekhulu has started her MSc study on the ‘Microbial quality of indigenous produce sold in the informal markets of South Africa during 2021’, working with vendors in Tshwane and Cape Town. Another project will look at the microbiomes surrounding zoonosis in swine-farming communities.

## Nutrition and health

(Project ID: 20302)

This project is led by Professor Rina Swart. It aims to update existing data on the dietary intake of both children and adults, and the elderly in particular. Activities in 2021 included:

Food consumption, gut-microbiome and chronic disease in disadvantaged urban and rural communities (Project ID: 20302 – WP 3.2.1), which will explore the relation between the composition of the gut microbiome and lifetime CVD risk profile among participants in the PURE study, with a particular focus on obesity.

Food consumption patterns (Project ID: 20302 – WP 3.2.2) is a National Dietary Intake Survey (NIDS) conducted on behalf of the National Department of Health (DoH), a project awarded to UWC in 2020. It will take the form of a study to determine foods and drinks consumed by various Living Standards Measure (LSM) groups in South Africa, and to understand factors

influencing their intake. The work is conducted by a core team from UWC, led by Professor Rina Swart (Department of Dietetics and Nutrition), under the auspices of the CoE-FS. This WP will incorporate other projects, namely:

- A desktop review that will assess the nutritional and dietary intake of different age and gender groups, using students supported through the leverage-funded NIDS.
- An impact evaluation of the Health Promotion Levy (HPL), with leverage funding from Bloomberg Philanthropies.
- The development of front-of-package labels (FOPL), with leverage funding from Bloomberg Philanthropies.
- Researching obesogenic food environments in South Africa and Ghana.

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## Maternal health and nutritional status of mothers

(Project ID: 20302 – WP 3.2.4)

This project funds postdoctoral fellows towards the exploration of maternal and child nutrition aspects of the Food Consumption survey. While no data from NIDS was available for analysis, the fellows played an instrumental role in the development of the instruments for the Food Consumption survey and the logistics planning for the survey. An alternative data source was identified

and two papers were prepared from this data. The study, called CRAM-MATCH, formed part of the National Income Dynamics Study – Coronavirus Rapid Mobile Survey (NIDS-CRAM) data collection, and used MomConnect during June and July 2020 to obtain information on hunger, breastfeeding and the mental health of pregnant women and women with young infants.







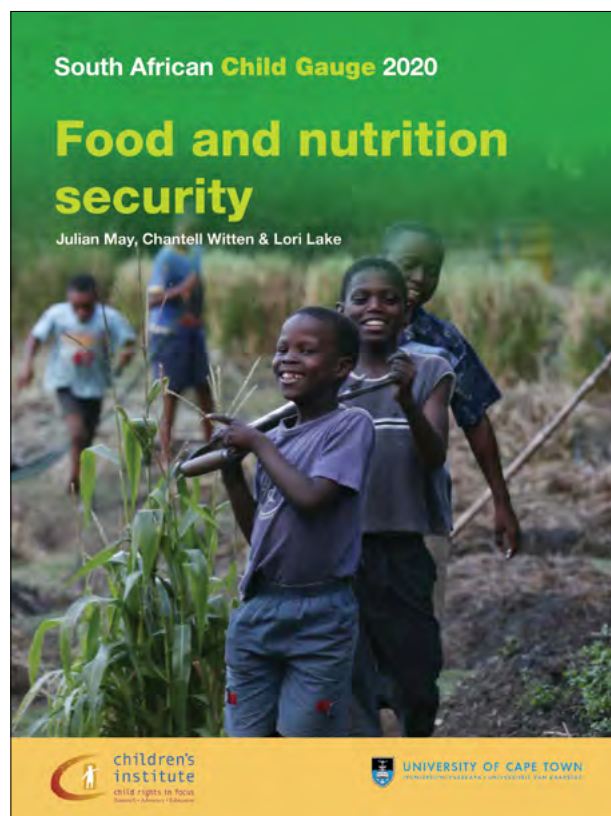
# CHILD MALNUTRITION

(PROJECT ID: 160101)

This project was led by Professor Julian May, UWC. Although ended, the four-year output from the Child Malnutrition Programme was brought together in the 2020 issue of the *Child Gauge*, for which Professor May was the lead editor. The *Child Gauge* brought together over 60 contributors from across the country, who drew on the latest evidence to reflect on current and emerging challenges – with a series of nine chapters and over 25 case studies illustrating challenges on the ground and showcasing promising practice.

The research has led to a spin-off pilot project in which Professor May serves as a team member. This is for the development of a software platform to improve safety and utilisation of sanitation and water source facilities among women in informal settlements. The aim is to provide an ICT platform via mobile phones that would enable women to report and receive information on the safety of latrines and water sources.

The project is funded by the Grand Challenges Africa via the African Academy of Science. It is led by Dr Rihlat Mohammed, a grantee of the CoE-FS, with Dr Douglas Momberg, who received a PhD bursary from the CoE-FS.





# LEVERAGE PROJECTS



**Leverage project:**

## SA-UK Bilateral Research Chair in Social Protection for Food Security in South Africa

This project is led by Professor Stephen Devereux (UWC). This research programme aims to critically interrogate why South Africa's comprehensive social protection system is not making a much more significant contribution to the eradication of food insecurity and hunger, and to identify how this contribution could be enhanced. No such systematic investigation has been conducted to date, so this agenda fills a significant and highly relevant gap in academic research and development policy. In the first three years of this SARChI, research and

policy engagement were conducted in several areas, including programmatic interventions (social grants, school feeding), cross-cutting themes (the right to food and social protection), and vulnerable groups (student hunger and seasonal food insecurity among farmworkers). This project produced several publications and a presentation in 2021.

**Leverage project:**

## Partnerships for Healthy Diets and Nutrition in Urban African Food Systems – Evidence and Strategies (NOURICITY)

This is a collaborative agreement between the project lead, ZEF, and the CoE-FS. The other PIs are at Wageningen University, UG and MAK, Uganda. The core team is Dr Nicolas Gerber (PL, team coordinator, ZEF); Professor Julian May (PL, UWC); Professor Felix Asante (PL, Ghana, UG); Professor Vincent Linderhof (Wageningen University); and Dr Coretta Jonah (UWC) (2018-2019).

The second project funded by LEAP-Agri is a collaborative leverage project with the project lead at ZEF, and the CoE-FS at UWC as the South African partner.

The research project investigates three factors influencing urban food systems. These are:

1. Urban food sources, characteristics (including food safety) and rural-urban linkages as 'systemic' drivers of food choices and nutrition.
2. People's access to nutrition-related knowledge (formal and informal, indigenous and Western), income, food tastes, habits and culture, as 'individual' drivers of food choices.
3. How systemic and individual drivers combine to determine people's food consumption and nutrition status.

The project comprises the following WPs:

- Urban food system mapping, with the project agreement sitting with UCT: to complement existing data on the formal and informal food retail outlets in Langa,

supplementary data has been collected to map the location of social services and facilities, allowing researchers to identify and trace the linkages between stakeholders and product flows that extend beyond the local urban food system. COVID-19 restrictions delayed some project elements.

- Safe and nutritious food for Africa's cities, which will be reported on in the Food Safety Project.
- Dietary transitions in Africa, where data has been analysed from two country cases – Ghana and South Africa – to examine changes in BMI and other nutrition status indicators, as people move from non-urban to urban areas, and the possible contributors to these changes. This WP relies on secondary panel data from the Ghana Socioeconomic Panel Survey and the South African National Income Dynamics Study, as well as the respective country Demographic and Health Surveys (DHS). The Ghanaian analysis has been delayed following the resignation of Dr Jonah from UWC in 2021.
- Exploring the links between food and nutrition messaging, local food knowledge systems and food experiences and eating practices in Langa. This project agreement is with the SAMRC. The overall aim of this WP is to develop a deep understanding of poor people's interactions with and interpretations of nutrition information and guidelines/ regulations related to nutrition and health. Stakeholders will be engaged only once data collection and analysis are completed in 2022.



**Leverage project:**

## Exploring Food System Transformations in Rapidly Changing African Cities (FOOD4CITIES)

This is a collaborative agreement between the project lead, Vrije Universiteit-Amsterdam (VU-A), and UWC. The other collaborators and Pls are at KU Leuven and MAK. The core team consists of Professor Peter Verburg (PL, team coordinator) (VU-A); Professor Anton van Rompaey (PL, Kampala) (KU Leuven); Professor Shuaib Lwasa (MAK); Dr Jac Davis (VU-A) (2018-2020); Dr Nyasha Magadzire (UWC) (2019-2020); Ms Lisa-Marie Hemerijckx (KU Leuven); Professor Julian May (PL, Worcester, UWC), and Mr Raymond Esau (BVM). The goal of the project is to develop a spatial model of food availability, food access and food utilisation across a city and the surrounding area, and will include the creation of maps that predict which city locations are likely to experience different types of food-related challenges. The project will focus on two cities: Worcester in the Western Cape as a secondary city, and Kampala in Uganda as a metropolitan city.

The project comprises the following four WPs:

- Knowledge co-production and participatory planning: engagement with stakeholders in the two cities is ongoing, and includes multiple levels of government, agricultural producers and research partners.
- Characterisation of the food system: fieldwork started before the pandemic, allowing researchers to model city responses to food insecurity during 2020. Results were shared with the Breede Valley Municipality,

which Worcester falls under. The proposal of Mr Ashley Haywood was finalised and approved by UWC, while the master's thesis of student Mr Durno was delayed by COVID-19.

- Model food systems dynamics and explore alternative futures: urban growth and food security models have been developed in parallel by the Food4Cities team, with the former currently in prototype for Kampala. The food security model is in prototype for Worcester.
- Collaboratively plan for the future: using the primary data collected and geographic data provided by the BVM and the provincial Department of Agriculture, researchers have modelled city responses to food insecurity during 2020. Due to its participatory nature, this WP has been severely delayed by COVID-19, and the remainder of this activity will take place in 2022. Plans to send two UWC postgraduates to VU-A and to KU Leuven in 2020 were also postponed, as was a dissemination workshop with BVM and the scaling partner, SALGA.

Overall, the Food4Cities Project has experienced delays of 12 months due to the restrictions on travel; an extension of one year will be required, to conduct the dissemination workshops with the local stakeholders and for the completion of the predictive models.

**Leverage project:**

## Articulation of food system governance at national level

This project is led by Professor Julian May, UWC. It seeks to foster discussion and understanding of the articulation of food system governance at national level. The activities involve engaging with national policymakers and other stakeholders through the implementation process of the integrated national FNSP 2017-2022, the National Development Plan, and other national policies that impact on food and nutrition security.

The objectives of the project are to:

- Engage with national policy through dialogue, policy analysis, and systematic review.
- Engage with the food and nutrition implications of 'hot topics' that arise, such as land reform, food safety governance, climate change mitigation, the SDGs and COVID-19 mitigation.
- Engage with international experience of policies for food and nutrition security to explore national experiences of food policy dialogues.

The work incorporates two new WPs:

1. **The South African Rapid Food System Assessment**, supported with leverage funding. The Assessment is a collaboration between the CoE-FS, the EU, the FAO, and CIRAD. It is part of a global initiative, 'Catalysing the sustainable and inclusive transformation of food systems'. It employs data provided by the FAO and Stats SA, as well as other sources such as the Food Dialogues conducted by South Africa's DALRRD in 2021; while the CoE-FS's Research Manager, Dr Elaine Sinden, did a review of the food-system implications of South Africa's spatial planning policies. The Rapid Assessment was implemented between July and November 2021, and its results were compiled into four Key Sustainability Questions (KSQ). Over 30 academic researchers were invited to peer-review these KSQ and levers, and the results were presented to the South African Steering Committee for the UNFSS convened by DALRRD in August 2021. Finally, four thematic consultation workshops (imbizos)

were held during October 2021. The final report has been submitted to the EU and FAO for approval, as well as to DALRRD and the National Agricultural Marketing Council, for consideration in the consultative process for the preparation of the Agriculture and Agro-Processing Master Plan (AAMP) and the Technical Coordinating Committee of the FNSP. The report identifies four core challenges to assist South Africa's transition towards a sustainable food system: improved nutrition, sustainable agriculture, levelling the food system playing field, and improved food-system governance. Several policy levers are recommended. The plan is to convert the report into a series of science communication outputs and at least two academic publications in 2022.

2. **Transitions to Agroecological Food Systems: South Africa (TAFS)**, launched in 2021 with leverage funding secured by Professor May and Professor Losch. TAFS is a multi-country project coordinated by CIRAD with five partnership research platforms: Information pour la Sécurité Alimentaire (ISA), PP&G-GovInn (Public Policies and Governance), and Systèmes de Production d'Altitude

et Durabilité à Madagascar (SPAD) in Africa; Markets and Agriculture Linkages for Cities (Malica) in South-east Asia; and Red Políticas Públicas and Desarrollo Rural (PP-AL) in Latin America. TAFS collaborates with the Transformative Partnership Platform (TPP) on agroecology initiated by France and the Consortium of International Agricultural Research Centres (CGIAR), where it contributes to the policy component. The project is implemented in nine countries: Burkina Faso, Mali, Madagascar and South Africa; Laos and Vietnam; Argentina, Brazil, and Colombia. The first stage of the project in South Africa was implemented by the CoE-FS in collaboration with the SAFL at SU, with the contribution of Professor Scott Drimie and Dr Stephen Greenberg. Specific initiatives and current policies related to agroecological transitions at the national level were identified with stakeholders. A number of strategic opportunities for work on agroecological transitions have also been identified. The WP received additional funding of €22 000 from CIRAD in November 2021, and will continue in 2022 with an analysis of selected case-study interventions in the Western and Eastern Cape, and in KwaZulu-Natal.

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## UNESCO Chair in African Food Systems

Held by the CoE-FS Director, this Chair was established and launched in 2017. An inception meeting of the founding institutions in Tunisia in 2019 confirmed the following objectives for the position:

- To support transdisciplinary modes of enquiry to better inform the analysis of food systems in Africa.
- To promote and facilitate Africa-wide partnerships for research, innovation and training activities.
- To foster a transformative agenda for African scholarship on the food system through research, training and engagement; by providing opportunities, leadership, evidence for decision making and informed debate, and critique of policies and programmes aimed at addressing food insecurity.

Unfortunately, plans prepared at the Tunisia meeting were significantly disrupted by the COVID-19 pandemic, including the raising of a mobility fund for African scholars; plans for the Chair to spend part of his planned sabbatical leave with the Chair in World Food Systems in Montpellier and at BDU in Ethiopia, to strengthen collaborations; a pre-conference symposium at the Fourth International Conference on Global Food Security; and fundraising for a secretariat for the Chair. In 2021, the Chair conducted several presentations.



## KEY PERFORMANCE AREA 2:

# EDUCATION AND TRAINING

### Education and training number

In total, the CoE-FS supported 83 students in 2021 (both NRF- and leverage-funded students). Of the 35 NRF bursaries awarded in 2021, 23 were continuing student bursaries and 12 were new student bursaries. Of the 12 new student bursaries, 10 were funded by the NRF-HICD (Human and Institutional Capacity Development) and two by the CoE-FS.

### Synthesis of training

The table below presents the spread of NRF bursary holders. This information is drawn from the NRF online system, and only reflects those students holding NRF bursaries.

#### Record of NRF bursary holders

Category	Total
Honours students	0
Master's students	12
Doctoral candidates	16
Postdoctoral fellows	7
Total postgraduate students	35
Total RSA master's and doctoral students	25
Total students from African countries (master's and doctoral)	4
Total foreign (not from Africa) master's and doctoral students	0
Female master's and doctoral students (RSA)	20
Black master's and doctoral students (RSA)	21
Honours / BTech graduations	1
Master's graduations	8
Doctoral graduations	2

The table below provides information about the students across the collaborating institutions. This information is drawn from the NRF online system, and only reflects those students holding NRF bursaries.

**NRF bursary holders across collaborating institutions**

2020	Level				
Institution	Doctoral	Honours / BTech	Master's – Research-based	Postdoc	Total
SU	-	-	-	-	-
UCT	-	-	-	-	-
MRC	-	-	-	-	-
UP	5	0	6	2	13
UFH	-	-	-	-	-
UL	-	-	-	-	-
UWC	11	0	6	5	22
WITS	-	-	-	-	-
<b>Total</b>	<b>16</b>	<b>0</b>	<b>12</b>	<b>7</b>	<b>35</b>

**Record of leverage-funded students supported in 2021**

Category	Total
Honours students	3
Master's students	14
Doctoral candidates	24
Postdoctoral fellows	7
<b>Total postgraduate students</b>	<b>48</b>

**Graduations / fellowships completed**

In 2021, a total of 30 bursary holders graduated: 11 NRF-funded students and 19 leveraged-funded students.

**Record of NRF degrees conferred and postdoctoral fellowships completed in 2021**

Degree	Total
Honours	1
Master's	8
Doctoral	2
Postdoctoral fellows	0
<b>Total</b>	<b>11</b>

**Record of leverage-funded degrees conferred and postdoctoral fellowships completed**

Degree	Total
Honours	7
Master's	9
Doctoral	3
<b>Total</b>	<b>19</b>



# KEY PERFORMANCE AREA 3:

# INFORMATION

# BROKERAGE AND

# RELATED ACTIVITIES

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For much of 2021 the CoE-FS was without a communications manager, due to the resignation of Ms Mologadi Makwela in December 2020. The first task of the new communications manager, Ms Carla Bernardo, appointed in 2022, will be to rebuild the CoE-FS's presence online and in the public domain.

## Communication and visibility

The CoE-FS's research, events and activities are made available through various channels: the website, its social media accounts (currently, Facebook, Twitter and YouTube), and audio-hosting platform SoundCloud.

Highlights in 2021 included:

- Director Professor Julian May co-edited the *South African Child Gauge 2020: Food and nutrition security*, alongside CoE-FS awardee Dr Chantell Witten, the publication generating widespread media coverage.
- The staging of *Auntie Covidia and the Curious Calamities*, a three-day interactive play created under the project 'Nutrition, health, safety for food security: safe food'.
- Radio and television appearances included Dr Marc Wegerif on SAfm (public), co-director Professor Lise Korsten on 702 (commercial) and Professor May on Radio 786 (community).
- Media engagement on topical issues, including the UNFSS, the July 2021 riots, local government elections and mental health awareness month.
- Led by Professors Julian May and Bruno Losch, and as part of the assessment of South Africa's food system, the CoE-FS hosted four Food Systems Imbizo meetings, with over 120 participants from academia, civil society and government.
- The meetings of the Food Governance CoP remained one of the most engaged activities in the CoE-FS, meeting six times in 2021.

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## CoE-FS website

Unfortunately, as also happened in 2020, there were at least two further security breaches and instances of malware installed on the website towards the end of 2021. In response, all log-in details were changed, and the number of user accounts significantly reduced; various updates were initiated on the site;

and an additional security plug-in was installed, and a malware scan conducted. In 2022, the CoE-FS will consider moving the site to another host. Analytics issues must also be addressed, to improve access to the website and its usability.

## Multimedia communication

The CoE-FS continued to produce multimedia content, namely video and audio. While views are slightly down, videos are recording strong viewing numbers. Presentations of the CoP meetings are particularly popular.

YouTube	
<b>Views in 2020:</b> 1 193	<b>Views in 2021:</b> 1 763
<b>Watch time (hours) in 2020:</b> 68.7	<b>Watch time (hours) in 2021:</b> 68.3
An additional 25 users have subscribed to the DSI-NRF Centre of Excellence in Food Security's YouTube channel since 31 December 2020.	

## Nuggets: Internal and external communication

As is to be expected, given the absence of a communications manager, the number of internal nuggets was lower than in previous years – but not drastically so. External media coverage was significantly lower than in previous years. However, there were opportunities for the CoE-FS to lead discussion and share its expertise, for example around the Medium-Term Budget

Speech and the various NIDS-CRAM reports. With the pandemic and its economic fallout still lingering, every effort should be made to improve media engagement in 2022 under the appointment of the new communications manager. Researchers are also encouraged to increase their media engagement.

Outputs	2014 / 15	2016	2017	2018	2019	2020	2021
Internal nuggets	12	9	52	67	73	55	44
External nuggets (media coverage)	55	45	129	239	189	404	74

## Social media

Social media remains a powerful if underutilised tool for communicating the work of the CoE-FS's scholars. To maximise this potential to amplify the centre's work, researchers and the communication team must work together, connecting frequently

and keeping one another up to date. In 2021, reach and engagement on the CoE-FS social platforms saw a decrease. However, the number of followers and likes has grown and continues to grow.

Platform	Growth by year						
	2014+2015	2016	2017	2018	2019	2020	2021
Facebook group	190	258	317	409	526	736	799
Facebook page (likes)	240	469	936	1 610	2 303	2 604	2 694
Twitter followers	245	640	1 134	1 714	2 099	2 541	2 604
YouTube views	n/a	n/a	430	1 519	1 607	1 993	1 763
SoundCloud listens	n/a	n/a	4	149	255	292	65

## Events

Events such as conferences, seminars and launches are an opportune way in which to connect researchers with relevant stakeholders, including the broader public and media – especially through the use of social media or livestreaming. In 2021, the Centre staged or participated in 66 events, including:

- Food Dialogues 2021
- The NRF South Africa-Tunisia bilateral workshop
- Potatoes South Africa (PSA) virtual research symposium

- SAAFoST 24th Biennial International Virtual Congress
- International Conference on Dietetics
- Pan-Africa Conference on Innovative, Inclusive and Afrocentric Social Protection in Africa.

The CoP meetings illustrated the potential outreach of events, having been covered on social media, in articles, and with video. This must be expanded in 2022.



# KEY PERFORMANCE AREA 4:

# NETWORKING

**Since its inception, the CoE-FS has established various national and international collaborations and/or partnerships fundamental to its work. In addition to formal agreements with 26 collaborating institutions, the Centre has nurtured research and networking collaborations with scholars and institutions across South Africa and internationally.**

Examples include:

- Researchers from several different institutions are involved in the Local Food Governance project, including UCT, UWC, Cape Peninsula University of Technology and SU.
- Collaboration with presenters at the 2019 AESOP-SFP Conference in Madrid has led to the publication of two papers in a special issue of the Urban Agriculture and Regional Food Systems journal.
- This collaboration has prompted consideration of CoE-FS contributions for a special issue of the journal Evidence and Policy.
- Collaborations have been developed with the Pandemic Action Network.
- Collaboration with City University London has resulted in the development of a draft paper.
- The initiative of the South Africa Rapid Food System Assessment has strengthened national collaborations on food governance and reinforced international collaboration with the FAO, the EU and CIRAD, as well as others.
- A project led by Dr Marc Wegerif on the impacts of COVID-19 on food systems in South Africa, Ghana and Tanzania continues in partnership with UWC, Ardhi University in Tanzania, and UG, as well as civil society partners.
- A proposal was submitted in 2020 for NRF-NOW funding for a project on the food-water-energy nexus in urban food systems. This is a collaboration across UP, UWC, the University of Venda and WU, as well as civil society partners.
- The SMART food project collaborated with the Norwegian Institute of Food, Fisheries and Aquaculture Research; VTT Technical Research Centre of Finland; University of Helsinki, Finland; Addis Ababa University, Ethiopia; and MAK, via the InnoFoodAfrica EU-funded project.
- Professor Naushad Emmambux was part of a consortium that applied for project funding for the 'SunGari' solar cooking solution, which included colleagues from the University of Greenwich (UK), UL, the University of Kassel (Germany), and the University of Lomé (Togo).
- Professor Emmambux was also part of a research team for a proposal on marine aquaculture, together with several local and international partners. The team also collaborated with Purdue University (USA), the University of Eldoret (Kenya) and the ITA Food Technology Institute in a USAID project, under the Feed the Future programme.
- Professor Ndiko Ludidi's collaborators include Dr Ifeanyi Egbichi (Walter Sisulu University), Professor Mounawer Badri (Centre of Biotechnology of Borj Cedria), Professor Marshall Keyster (UWC), Professor Hon-Ming Lam (Chinese University of Hong Kong), Professor You-Zhi Li (Guangxi University), Professor Yu Takahashi (Japan International Research Centre for Agricultural Sciences), Professor Robert Sharp (MU), Alina Mofokeng (ARC), Dr Nandipha Ndudane (TARDI) and Dr John Lisa (TARDI).
- This team has recently established a new collaboration with Professor Ueli Grossniklaus at the University of Zurich, for work on the marama bean.
- Besides the ongoing collaborations with PSA and Grain South Africa (GSA), the projects led by Professor Jacque de Waals have strengthened ties with both the Food Science and the Plant Pathology departments at the University of the Free State (UFS), as well as with Dr Mariette Marais of the ARC.
- The development of a soil health index for the eastern Free State will include collaborations between the UFS, GSA, PSA, CoE-FS, UP and some soil testing laboratories, facilitated by an intermediary such as GreenAgri or the South African National Accreditation System (SANAS).
- The group of researchers for the Food Safety project includes researchers from UP (the Departments of Plant and Soil Sciences, Veterinary Sciences, Food Science, and Consumer Sciences), and the Department of Animal Sciences at UFH.
- Collaboration with the DRDAR enables researchers on the project to use the modern, state-of-the-art veterinary laboratories in the Eastern Cape.
- This team has also established collaboration with the National Institute of Communicable Disease's Sequencing Core Facility.



- The Food Safety team has established collaboration with Professor Gabriella Berg (University of Graz, Austria). Collaboration has also been established with Professor Kalmia Kniel (UD), Professor Shirley Micallef (UMD) and Dr Manan Sharma (US Department of Agriculture's Agricultural Research Services).
- Researchers at UFH have an established collaboration with the French South African Institute in Agriculture (F'SAGRI), hosted by the Department of Livestock and Pasture Science at UFH, and were awarded an Erasmus+ International Credit Mobility programme with UniLaSalle (France).
- The NDIS project is a significant national collaborative effort, with a total of 43 academics and students from 11 HEIs (of which six are HDIs). The primary research output is the report for the national DoH. As per discussions with each individual member of the collaborating team, each person will have a specific contribution to make within a chapter.
- Professor Julian May's leverage funding raised from networking activities in 2021 includes: FAO Food System Rapid Assessment (R0.75m); UP African Food Systems Framework (R0.1m); co-awardee FOSC-ERAnet Food Insecurity in Secondary African Cities (€750 377); CIRAD Transition to Agro-Ecology in South Africa (€25 000).
- Prof May was invited to participate in an Experts Thematic Workshop on Food Systems Resilience in Africa and Europe that was coordinated by the International Institute of Tropical Agriculture (IITA), supported by the University of Copenhagen and WU.
- Prof May also participated in two video conferences hosted by INRAE and CIRAD in May, discussing setting up a joint research action plan for the African continent and in partnership with institutional partners of the continent.
- Professor May also participated in a roundtable, 'Food Security through Sustainable Food Systems: Fostering uptake in practice and in policy', organised by the Embassy of France in South Africa.
- Further, he participated in the Nourish to Flourish Worcester Learning Journey on 11 November 2021. This is a joint initiative of the SAFL, the African Centre for Cities at UCT and the WCG.
- He is a member of the Food Equity Centre, an international research group established by IDS, and chaired a plenary session at the inaugural annual meeting of the group in November 2021.
- Lastly, Professor May participated in the monthly Western Cape Food Forum meetings convened by the Western Cape Economic Development Partnership (EDP), an NPO that builds collaboration between government, civil society and other partnerships.
- In December 2021, it was announced that Professor May had been appointed to the South African National Planning Commission.



# KEY PERFORMANCE AREA 5:

## SERVICE RENDERING

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**All the PIs are involved in service rendering, which includes input into policy debates, keynote presentations, and facilitating workshops. The following are examples:**

- The CoP has continued to offer policymakers and other stakeholders access to current research findings informing policy deliberations. Programme members continued to offer informal advice to provincial and local authorities on food system governance matters. They were invited to participate in regular gatherings of the City of Cape Town Food Security Working Group. They also participated in monthly meetings of the Food Forum, coordinated by the Western Cape Economic Development Forum, and in the advisory committee of the 2021 Food Dialogues.
- The award of a CHEC grant for the development of policy briefs on food systems governance has led to ongoing consultation with relevant stakeholders to represent the interests and concerns of marginalised groups.
- The project led by Professor Naushad Emmambux has various partners locally including UJ, UL and DUT. This team has a good relationship with Tiger Brands, PepsiCo and RCL Foods in SA, and RISE Sweden and Puratos Belgium at an international level. Sensory evaluation services are rendered to industry partners.
- The project led by Professor Jacquie de Waals: an important collaboration has been developed between UP, potato farmers of the eastern Free State, PSA and GSA, to develop a region-specific crop rotation programme for the area. A long-term crop rotation study has been established (managed by Mr Gert Bester).
- The NDIS project is conducted as a tender from the DoH.
- Ms Makoma serves on the task team that is preparing the Obesity Prevention strategy 2022-2030 for the DoH.
- Professor Julian May chaired the Science for the Reduction of Poverty & Inequality standing committee of ASSAf, and was elected to the Council of ASSAf.
- Professor May serves on the Audit and Risk Sub-Committee of the Academy, and on the reference group of the Institutional Review of ASSAf that will take place in 2022.
- Professor May is Chair of the Board of Trustees of UWC's Dullah Omar Institute (DOI), and also chairs their management committee.
- Professor May serves on the External Advisory Board of DataFirst, a data archive service hosted by UCT.
- Professor May is a member of the Chronic Poverty Advisory Network board, convened by the Overseas Development Institute.
- Professor May is a member of the Advisory Committee for the ESRC/DFID Joint Scheme for Research on International Development, a £23 million grants programme.
- Professor May chairs the Advisory Board to oversee the execution of the Food Security and Nutrition Survey for South Africa.
- Professor May is a member of the ARUA Centre of Excellence in Sustainable Food Systems (ARUA-SFS) Steering Committee.
- Professor May is a member of the Scientific Advisory Committee of the DSI-NRF Centre of Excellence in Human Development, hosted by Wits.
- Professor May is also the Senate-elected member on research methodology for UWC's Human Subjects Senate Research Ethics Committee.
- Professor May reviewed one NRF rating application, and has refereed articles for Agrekon and for Sustainability.
- As the chair of the ASSAf standing committee on Poverty and Inequality, Professor May led the design and implementation of a three-part webinar hosted by the Academy in 2021.
- Professor Marshall Keyster from the Department of Biotechnology has been selected as one of 40 mentors in the ARUA-UKRI – GCRF FSNet-Africa fellowship programme.

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# CHALLENGES AND WAY FORWARD

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## Challenges and constraints

The global COVID-19 pandemic continued to present institutions and individuals with unprecedented challenges in 2021.

Universities and research centres such as the CoE-FS were not exempt from this global disruption. UWC and UP faced similar challenges; but also some that were unique to the host and co-host institutions.

In the case of UWC, the remote location of the university requires that the majority of students travel long distances by public transport, facing heightened levels of risk. In the case of UP, a considerable number of students usually live on campus but could not during the COVID-19 pandemic, as residences were closed or limited to one-third of all students. Both universities continued to limit access to their campuses; and in the case of the core staff, the CoE-FS operated from home offices throughout the year.

The biggest challenge for UP remained the lack of access to administrative and support staff. In contrast, postgraduate students and lecturing and research staff engaged fully with all students through hybrid teaching and meetings (both face-to-face and via one of the virtual platforms).

Postgraduate students could continue laboratory work, but had to book space on a weekly basis, and were restricted in numbers due to COVID-19 requirements. The introduction of the centralised system of bursary approval brought additional challenges in the context of little face-to-face engagement with students. This was especially problematic for multidisciplinary postgraduate programmes in which there is no direct undergraduate feeder programme.

Fortunately, face-to-face interviews were permitted during most of the year, and some of the social science research projects could resume. In some cases, such as projects that involved stakeholder engagement with government officials, research was not possible due to institutional rules and concerns over safety.

Finally, we are aware of students who experienced trauma when family members contracted COVID-19, and in some cases were hospitalised or died. The impact of the pandemic on the progress and mental health of our students and staff should not be underestimated. In particular, the burden of increased care work that has been placed on female staff and students must be noted. Although the CoE-FS itself is unable to provide counselling or other support, we are mindful of this situation

and have attempted to ensure that the research team affiliated with us provides support via one of the universities' well-being and support centres. Worthy of mention is the lack of cleaning staff in all buildings; this had a significant impact on the health and safety of staff and students, particularly in laboratories. Notably, biological and chemical waste removal were affected, and contributed to the health and safety concerns. An important additional challenge was obtaining critical chemicals, enzymes and molecular diagnostic kits from overseas, due to the prioritisation of providing stocks to COVID-19 testing labs. Running expenses were also severely affected by a sudden increase in prices of all laboratory equipment and chemicals provided during 2021.

As mentioned in the *2020 Annual Report*, the CoE-FS has faced pressure from food-system stakeholders to assist directly with feeding schemes, and to take activist positions regarding the rise in hunger and severe inequality that was becoming more obvious during COVID-19. While we have provided regular science communication, especially following the release of the *Child Gauge*, we have stepped back from an activist role, preferring to provide evidence that we believe to be robust. In some cases, such as with the rise in child malnutrition, this has involved identifying policy failure; and in other cases, such as with the NDIS survey, assisting the government.

We were unable and sometimes unwilling to engage with all of the requests that were submitted to us. In some cases we lacked the expertise, and used our CoP networks to refer the request. In other instances we felt that the available science did not support the request being made, and we were unwilling to be drawn into an activist role. Nonetheless, we continue to support campaigns to increase the CSG, and have also contributed to debates on a universal income grant and on regulation of the food industry. We were active in the publication of articles in non-academic media sources, as well as participating in radio and television discussions.

A final challenge has been to manage the constraints on mobility. In particular, projects that involved mobility grants to international universities have not been able to meet their capacity-building targets. We looked into new forms of doing such capacity building and networking in 2021. The use of collaborative learning tools such as MURAL is an option that we have piloted with the Rapid Food System Assessment, and subsequently with the FSNet Fellowship programme.



## Way forward

Despite the legacy of extreme inequality and structural poverty – and a recent history of mismanagement of public funds – South Africa possesses the resources of an industrialised, middle-income country, which can be used to fund and effectively implement its relatively well-developed food-security strategies, policies and regulations. The CoE-FS also has the expertise, standing and capacity to drive change and make an impact on innovation and the bioeconomy, contribute to improved governance, and ultimately alleviate hunger and food insecurity.

The paradox of poor food-system outcomes points to the need for a more assertive approach that takes into account the country's system of government, its unique spatial and environmental challenges, and the dual economy. A significant refocus of political will by government – and at all levels – will be necessary, if a transition towards a sustainable and just food system respectful of people and the environment is to be achieved. Some elements for an improved food system are recognised: the South African Bill of Rights, the Constitution, the flagship NDP and the FNSP all address food and nutrition security. However, a fully integrated approach is missing, and insufficient attention is paid to the achievement of food-system outcomes relating to livelihoods, environmental sustainability and territorial balance. Further, the trade-offs and synergies that result when promoting different objectives are not considered in any detail. These shortcomings also apply to other sector-specific policies and spatial plans.

The activities of the CoE-FS focus on the fundamental values of South Africa's Constitution: human dignity, the achievement of equality and the advancement of human rights and freedom. In particular, many of the policy recommendations that we have identified from our findings emphasise the need for legislation and processes that will actualise the progressive right to food security for all, and the absolute right to adequate nutrition for children. These have been matched with recommendations that call for improving production and food networks, economic inclusion, and strengthening the institutional architecture of the food system: better coordination, accountability, and the enforcement and improvement of existing regulations. These are brought together in a final challenge in which improved governance becomes the connector between the different challenges faced by the South African food system.

Following discussions during our Lekgotla, CoP and stakeholder consultations, we propose that a way for improvement and political mobilisation is through more decentralised governance, with more local-level mandates, and more financial support. In particular, a focus on children-centred food systems could be a way of mobilising a common agenda, despite differences. Engagement with civil society organisations will be key to the success of the process. This should include the organisations of informal sector traders, smallholder and subsistence farmers, consumer groups, and vulnerable groups such as the youth, the elderly, farmworkers and the homeless.



This proposal recognises that people live in places and not in sectors, and places offer the appropriate context to deal with local challenges, opportunities and constraints. Places offer opportunities to establish coalitions of actors who share goals, and a way in which networks of stakeholders can mobilise local resources and dedicate them to projects that are of local importance. They are also spaces of coordination and contestation between actors, where the local resources can be 'activated' through collective action and become an answer to shared challenges, including those related to environmental sustainability.

A final critical element in the food-security framework is the creation of a safe food system for all. Adapting a highly self-regulated, internationally approved food-safety management system in agriculture and the food industry to a more 'fit-for-purpose' framework for small farmers and small and medium enterprises in food processing, distribution and trade in the informal sector will be key to sustainability and addressing food security. Adapting and adopting safe food systems for all will contribute to a more food-secure future for all.

Looking forward, the 2021 Lekgotla of the CoE-FS identified our comparative advantages. We are a transdisciplinary and multi-institutional centre, and we have adopted virtual and flexible practices since our inception. Also since inception we have focused on providing enabling research management and science communication, under the guidance of Dr Elaine Sinden, our centre manager, and Ms Elaine Petersen, our finance manager.

We have research strengths in the analysis of multi-level food-system governance, knowledge co-production and impact pathways. We have strengths in research and innovation for the production and utilisation of climate-smart indigenous African and other locally available foods. And we have strengths in the analysis of diets and practices that provide quantity, quality, diversity and safe food to reduce all forms of malnutrition and hunger.

In a more technical context, the recent investment in the CoE-FS national diagnostic platform will support a more rapid response to extreme events and risk mitigations. The National Equipment Programme, funded by the DSI through the NRF, provided the third piece of state-of-the-art research equipment commissioned at UP to firmly establish the national CoE-FS food safety and plant health platform. This will enable scientists to address critical emerging challenges in the country, such as food safety outbreaks, e.g. listeriosis, biosecurity threats, African Swine Fever, plant health and phytosanitary risks, Karnal bunt disease, and the growing concern over antimicrobial resistance in One Health. The newly commissioned MALDO Biotyper Sirius is a world-class research tool that provides reliable, fast and efficient high throughput and cost-effective and robust identification of microorganisms. This national diagnostic platform will contribute towards advancing the national research and development agenda, and support research capacity and skills development.

**South Africa's Bill of Rights is grounded in principles of universality and inalienability; indivisibility, interdependence and interrelatedness; equality and non-discrimination; participation and inclusion; accountability and rule of law. Addressing the food-system paradox is fundamental if these principles are to be respected.**

In 2019, the president of South Africa identified seven priorities for a 'whole of society' approach. These are economic transformation and job creation; education, skills and health; consolidating the social wage through reliable and quality basic services; spatial integration, human settlements and local government; social cohesion and safe communities; a capable, ethical and developmental state; and a better Africa and world.

To contribute towards these priorities, as well as to the imperative of building back better following the COVID-19 pandemic, the MANCO of the CoE-FS have committed to further promoting transdisciplinary research and encouraging the formation of research teams across faculties and institutions.

We will promote collaborative work among researchers within and across universities and disciplines, making it possible for researchers to work in teams. We intend to identify joint training opportunities for postgraduate students and early-career researchers across faculties and institutions. We will need to rebuild and expand our science communication activities to contribute towards knowledge translation and utilisation. Finally, we will engage with our sister research organisations such as the ARUA Centre of Excellence in Sustainable Food Systems, the ASSAf, the SAFL, and centres and units at our collaborating universities, especially those that are HDIs.

Notwithstanding the resource constraints that confront the country, South Africa's Bill of Rights is grounded in principles of universality and inalienability; indivisibility, interdependence and interrelatedness; equality and non-discrimination; participation and inclusion; accountability and rule of law. Addressing the food-system paradox is fundamental if these principles are to be respected.

Reprioritising the budgets, and reallocating and reorienting the human resources of national, provincial and local government, together with more effective taxation, will be needed to generate the resources that are required.

The functioning of local food systems will thus remain a focus area of the CoE-FS in the future. We hope that these projects will enhance our transdisciplinary work, grow our partnerships with civil society and government, and significantly contribute to national human capacity and skills development.



The text-only version of the *CoE-FS Annual Progress Report 2021*, from which this publication is derived, was compiled by Julian May, Lise Korsten, Elaine Sinden, Elaine Petersen, and Carla Bernardo.

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