Building a SA-NL Knowledge Ecosystem

An overview of joint activities in the knowledge sector
About this booklet

This booklet showcases the collaborative activities organised by the two governments, Nuffic, the Dutch Research Council (NWO) and/or the National Research Foundation (NRF) of South Africa to enhance South African and Dutch co-operation in education, research and innovation. It is not fully representative of the scope and intensity of educational and science activities or collaboration in the sector. The organisations and individuals involved in compiling the booklet are interested in hearing about other collaborative activities between the two countries. We invite you to share your activities and collaboration with us via southafrica-merian@nwo.nl.

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Introduction

South Africa and the Netherlands have a longstanding co-operation in education and research. Higher education institutions have collaborated for decades. 2022’s re-signing of the MoU on Science and Technology was a milestone in this partnership.

2022 saw the collaboration celebrated with a bilateral event during the World Science Forum in Cape Town. The objectives were to showcase the success of bilateral collaboration, gain more insight into the current state of the co-operation in education, innovation and research, and analyse where synergies could be achieved or intensified. Another objective was to specify what was needed in order to create an enabling environment, as well as determine the most relevant subject areas for all parties involved (future agenda).

With representatives from the knowledge, public and private sectors, the event successfully placed education, research and innovation in a broader context. This was a step towards a knowledge ecosystem, in which knowledge-related initiatives can be complementary, enrich each other, and build upon each other’s results. The fact that the event was organised with four partners – the NRF, Nuffic, NWO and the Dutch Embassy – and the involvement of stakeholders significantly contributed to this. The strong bilateral relationship was also confirmed by Khaya Sishuba, who was the South African Department of Science and Innovation (DSI)’s director of bilateral relations at that time.

2023 has been an equally exciting year, with the inaugural Dutch Education & Science Counsellor establishing an office in South Africa. Berto Bosscha started in the position in October 2022 and has since focused on deepening relations and contributing to equitable partnerships. One of the flagship initiatives, launched by the office of the attaché in collaboration with the South African government, is a series of policy dialogues that bring stakeholders together on issues jointly identified by higher education and TVET stakeholders. 2023 is also the year of the first Dutch Knowledge Mission to South Africa, led by minister Robbert Dijkgraaf.

Read more about the continued bilateral engagement on various levels throughout the knowledge sector in this booklet. This continued engagement is testament to the potential of developing an even more impactful and coherent approach that contributes to shared interests such as societal and global wellbeing.
Building a SA-NL knowledge ecosystem – Overview of collaborative activities

South Africa and the Netherlands share a longstanding education and research partnership. Their collaboration spans student exchanges, joint research initiatives, shared degree programmes, and participation in European and community engagement projects.

**Dialogues**

In recent years, education and research dialogues have been organised to strengthen the synergy between the different bilateral initiatives in the fields of research, innovation and education. These events have successfully placed these fields in a broader context and are steps towards a SA-NL knowledge ecosystem, in which different knowledge-related initiatives can be complementary, enrich each other, and build upon each other’s results. These efforts are complemented by the policy dialogues that the NL Embassy and the SA Department of Higher Education and Training initiated in 2023.

**Education and Science attachés**

Both countries have (recently) assigned attachés to further strengthen the bilateral collaboration in education and science.

**Erasmus+ Mobility**

<table>
<thead>
<tr>
<th>FUNDER</th>
<th>EU</th>
</tr>
</thead>
</table>
| BUDGET | 2022: € 493,674 SA-specific  
2023: € 157,580 SA-specific |
| STATUS | 2022: 99 incoming and outgoing mobilities granted  
2023: 42 incoming and outgoing mobilities granted |

**Capacity Building in Higher Education**

<table>
<thead>
<tr>
<th>FUNDER</th>
<th>EU</th>
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</table>
| STATUS | 2020: 1 project funded that involves SA-NL institutions  
2023: 2 projects funded that involve SA-NL institutions |

**Partnership in Astronomy**

<table>
<thead>
<tr>
<th>FUNDER</th>
<th>NRF, NWO</th>
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<tr>
<td>BUDGET</td>
<td>€ 2 million</td>
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</table>
| STATUS | Astronomy and Enabling Technologies for Astronomy: 13 joint research projects and 5 individual visits  
DOME-SA: public-private partnership on advanced ICT for radio astronomy  
MeerLICHT: Inaugurated in May 2018  
Collaboration in VLBI: developing VLBI capabilities with MeerKAT |

**Collaborations**

The Netherlands is placed 6th in the number of South Africa’s international research collaborations.*

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### Orange Knowledge Programme (OKP)

**FUNDER:** Dutch Ministry of Foreign Affairs  
**BUDGET:** €220 million (total programme budget) /  
+ €7 million SA-specific  
**STATUS:** In SA, the OKP focuses on training and skills development in food and nutrition security and water management, with a specific focus on technical and vocational skills. The following have been awarded:  
- 3 institutional collaboration projects  
- 2x Tailor-Made Training Plus  
- 2x Tailor-Made Training  

[www.nuffic.nl/okp](http://www.nuffic.nl/okp)

### Water-Energy-Food Nexus Research Programme

**FUNDERS:** NRF, NWO  
**BUDGET:** R5-R11 million per year (NRF)  
€1.4 million per year (NWO)  
**STATUS:** 2020: 2 research projects  
2021: 2 research projects  
2022/3: 4 research projects  
2024/5: call anticipated in 2024  

[www.nwo.nl/mfsouthafrica](http://www.nwo.nl/mfsouthafrica)

### NRF-Nuffic Doctoral Programme

**FUNDERS:** NRF and Dutch Ministry of Education, Culture and Science  
**STATUS:** Since 2017: 46 grants for South African PhD candidates to enrol for a full-time (4 year) or joint PhD with Dutch knowledge institutions  


### Science Diplomacy Fund

**FUNDER:** NWO  
**BUDGET:** €19,000 per Embassy Science Fellow  
**STATUS:** 2022: 1 Embassy Science Fellowship awarded in SA  

[www.nwo.nl/sdf](http://www.nwo.nl/sdf)

### CoCreate My City CoLab

**FUNDERS:** Embassy of the Kingdom of the Netherlands in South Africa  
Netherlands Enterprise Agency (RVO)  
**BUDGET:** €35,000  
**STATUS:** The platform for SA-NL counterparts to exchange innovations for a sustainable future is active  

[coccreatesa.nl](http://coccreatesa.nl)

### Internship Programme (Focus on Smart Technologies)

**FUNDERS:** SA Embassy in The Hague, SANEC Smart Tech Desk, Nuffic  
**STATUS:** Since 2021: 21 students and recent graduates have completed an internship  

mid-October 2022, Berto Masibulele Bosscha started a four-year journey as the first Education & Science Counsellor of the Netherlands to South Africa. Brought up in the Netherlands, but born in South Africa in the Eastern Cape (in the former Transkei) to parents deeply committed to supporting the community, his roots in this beautiful country drew him back again. We sat down to ask Berto a few questions about his experience and to learn more about the man who is working to elevate NL-SA relations in the field of education and science.

We started by looking at some of Berto’s memorable moments.

**Tell us some of your memorable moments of the past year**

I’ve had many wonderful moments. One specific trip that stands out to me is a visit to the University of the Free State, specifically the QwaQwa campus. In many ways this visit was the testing ground for ideas I had for working in South Africa. For example, we did a try-out for policy dialogues that have now become a core part of my work. We also looked into alternative forms of collaboration, such as virtual engagements. And on top of that it was an opportunity to combine the interests of multiple Dutch ministries. I was accompanied by the Ministry of Agriculture, building on their existing network and activities in the province.
The visit also confirmed the importance of the role of Education & Science Counsellor, namely, bringing governments closer to institutions and bringing governments closer to each other – putting government at the same table as institutions.

Berto continues to reflect on the year by highlighting the importance of building a network. My aim was to meet a new person or organisation every week ... and I achieved that.

What surprised you about living in South Africa?

How similar the two countries are when it comes to aims and goals for education and science. The contexts are so different, but in general you can say we strive for similar things, such as equal chances for all, ensuring that students are much better prepared for their personal and professional lives after graduating, and a stronger connection between the academic sector and the surrounding communities.

Another more basic resemblance: we know how to complain. Berto laughs. In South Africa this is combined with the enjoyment of what works and a strong appreciation of good things, no matter how big or small. I realise that I’m saying this from a very privileged position, but diversity is the standard in South Africa and that strengthens innovative perspectives and approaches.

I struggled to bring the voice of students into my work, as student representation in South Africa is more aligned with political parties than it is in the Netherlands. So how do you make sure all student groups have a say and are represented in national and institutional policies? I feel supported by the Embassy I represent, which spearheaded the installation of a youth advisory forum for our policies.

If you could share a message to all youth in South Africa, what would it be?

There are a few things that I would like to encourage the youth to do. Know what you want for your life, and GO for it! Don’t be afraid to reach out to people to support you. It doesn’t mean that you won’t be disappointed though. And don’t think that your age, background or current position mean that your ideas don’t matter.

As the interview draws to a close, we ask a few final questions to really get to the heart of this man. Heading into his forties, he still has the energy and passion of a young man – as seen in his boyish grin and his personal commitment to understanding the SA context in the best possible way, right down to learning isiZulu and practicing his ‘clicks’ throughout our discussion.

Who is Berto when he is at home?

I straddle two sides: at heart I’m a family man; my ‘alone time’ is with family and friends – there it’s easy to be happy. But I also like exploring. Sometimes on a small scale, like discovering new streets around my house. Sometimes on a bigger scale, like a new region, or more in-depth such as the reasoning behind people’s behaviours.

Berto leans back in his chair. I’m goal-oriented, but above all I’m about the ‘WHY’? About truly understanding the reasons why people do what they do. This is more the sociologist and anthropologist in me.

Berto, what is your ‘why’?

Often we look at each other and focus on what people do. But if we take a little bit more time to understand the reasoning behind what people do, then we find a deeper common ground. This helps us to stop sticking plasters on problems and instead to work on actual solutions and innovative new approaches, using each other’s unique talents and expertise. This means that taking slightly more time in the beginning helps to make stronger connections, which contribute to establishing long-lasting ties with which we aim for the deepest impact.

So what is my why? I want people to have a better understanding of each other, their perspectives, their circumstances. To see each other’s strengths and spaces for improvement, but to exchange their own too as a result. Helping people to search together. In that sense: my ‘why’ is contributing to being useful, understanding both sides, and crafting collaboration together in a constructive way.
Despite the different contexts, the similarities of the aims, challenges and struggles in both countries are remarkable. As a result, South African and Dutch governments and institutes see each other as important partners for learning together and from each other. The main aim of the bilateral collaboration is therefore: to build a community and network between South African and Dutch stakeholders.

A series of policy dialogues was selected as the mode of engagement. The strategic approach to the dialogues was shaped along two lines:

- Diplomatic collaboration on governmental level: the aim is to formalise this during the Knowledge Mission led by minister Robbert Dijkgraaf (October 2023) by signing an MoU on Higher, Technical and Vocational Education.
- Enhanced institutional co-operation between South African and Dutch institutions on all levels of post-secondary education. The initial engagement will be on the basis of a series of virtual policy dialogues.
The chosen strategy aims to give stakeholders on both the South African and Dutch sides the opportunity to get a deeper sense of each other’s policies and frameworks for engagement. What are the common and individual aims and challenges? A broader understanding of each other’s systems and challenges contributes to knowledge exchange, and jointly determines the roles of government, institutions or other parties in and around the education and science eco-system as well as determining where relevant opportunities for collaboration lie.

Developing the focus areas

The policy dialogue series was initiated with a conversation between the Dutch Education and Science Counsellor and his colleagues at the South African Department for Higher Education and Training (DHET). Jointly, three main areas were identified for the Technical and Vocational Education and Training Sector (TVET) and three for Higher Education (HE). The topics address questions that are equally relevant for the Dutch context, albeit in a different society and slightly different system.

The main topics for the TVET sector are:
1. Curriculum development and teacher skills;
2. Internationalisation strategies between South Africa and the Netherlands;
3. Science and TVET.

The main topics for the Higher Education sector are:
1. Internationalisation strategies between South Africa and the Netherlands;
2. Leadership and Governance;
3. Open Access and Open Science.

The first two dialogues for both TVET and Higher Education had been completed at the time of this publication. The dialogues were well-attended throughout and underlined the interest from the broad sector in developing a deep and mutual understanding of the context, challenges, and most importantly opportunities to make a significant contribution to the knowledge sectors and societies. A central message from all four dialogues was the need for collaboration. ‘If you want to go fast, go alone. If you want to go far, go together.’ Growing together is the main goal.

Two further dialogues have already been scheduled in the series and will take place in January 2024. For more information and to join the conversation, please send an email to pre-owa@minbuza.nl.
Water-Energy-Food Nexus Research Programme

As part of the long-term and wider bilateral scientific collaboration, the National Research Foundation (NRF) of South Africa and the Dutch Research Council (NWO) agreed in 2019 to start a joint research programme with a focus on the Water-Energy-Food (WEF) Nexus and biannual calls for proposals. Achieving water, energy and food security for human wellbeing is approached in an integrated, coherent and cross-sectoral manner.

Aims and objectives

The NRF and NWO decided to continue the strong, sustainable research collaboration between the two countries by issuing biannual calls for proposals in support of the Sustainable Development Goals.

By inviting consortia in which researchers from knowledge institutions from both countries collaborate with partners from public, semi-public and/or private organisations (for-profit and not-for-profit) and by combining the generation of new scientific knowledge with providing sustainable, innovative solutions, the NRF and NWO intend to maximise the relevance and impact of the research funded.

Research consortia are expected to make optimal use of South African-Dutch research strengths in various disciplines and to build as much as possible on existing knowledge and current relevant initiatives. The consortia have to cross scientific disciplinary boundaries (interdisciplinarity) and integrate scientific and practitioners’ knowledge into joint research efforts (transdisciplinarity).

At present, three calls under the thematic WEF nexus theme have resulted in eight awarded projects and a fourth call is anticipated in 2024. The fourth call will be in collaboration with participating councils of the Science Granting Councils Initiative (SGCI). The SGCI, a multilateral initiative established in 2015, is strengthening the institutional capacities of 16 public science funding agencies in Sub-Saharan Africa in order to support research and evidence-based policies that will contribute to economic and social development.

More information on www.nwo.nl/mfsouthafrica
**Nexusing Water, Energy and Food to increase resilience in the Cape Town Metropolitan Region**

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<th>South African Principal Investigator</th>
<th>Consortium</th>
<th>Key words</th>
<th>Disciplines</th>
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<tbody>
<tr>
<td>Prof. Mark Swilling, Stellenbosch University</td>
<td>Utrecht University, Stellenbosch University, University of the Western Cape, Western Cape Economic Development Partnership (EDP), International Council for Local Environmental Initiatives (ICLEI), Association of Dutch Water Authorities, Vitens N.V.</td>
<td>Urban governance, Urban nexusing, Infrastructures, Resilience, Complex urban systems</td>
<td>Geography, Planning, Development studies, Constitutional and administrative law</td>
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<tr>
<td>Dutch Principal Investigator</td>
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<tr>
<td>Prof. Jochen Monstadt, Utrecht University</td>
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<td>Duration</td>
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<td>2021 – 2024</td>
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**Summary**

This research project proposes to develop a water, energy and food nexusing approach that increases resilience capabilities in the Cape Town Metropolitan Region. The water-energy-food nexus has emerged as a framework for integrated resource management. To date, however, the practical adoption of nexus approaches into governance practices and policies has lagged behind policy ambitions. The contention of this proposal is that to increase the scientific and societal value of nexus approaches, an expanded view on nexusing processes is required.

Therefore, this project will critically explore the water-energy-food nexus through three main points of departure: the first is to understand the multi-dimensional interaction of water, energy and food systems. The second is to assess how the water-energy-food nexus materialises in selected socio-spatial contexts in Cape Town. Thirdly, the aim is to understand the wicked governance challenges of mitigating, coping with, preparing for, and adapting to urban resource crises. Finally, the project will develop multi-scale procedural guidelines and policy briefs to inform nexusing practices. To achieve these objectives, the research adopts a complex systems approach which systematically addresses the multidimensional nature of the water-energy-food nexus. Through a multidisciplinary approach and in close collaboration with societal partners, WEF nexusing will be explored as a broader process-oriented approach to how resources do, and can, interact and be governed across siloed domains.

This is a crucially important endeavour in the city of Cape Town which faces a triple exposure to interrelated water, energy and food crises. Through this expanded perspective, and emerging from the urgent need for concerted urban action, this broader view of nexusing will be framed through the conceptual lens of urban resilience. The research will assess the vulnerabilities and resilience of complex system interactions to develop recommendations for co-ordinating resilience strategies that work complementary to existing governance arrangements.
Longue Durée of WEF in post-extraction landscapes – WEF POST LONGUE DURÉE

South African Principal Investigator
Prof. Hannah le Roux,
University of Witwatersrand

Dutch Principal Investigator
Prof. Fransje Hooimeijer,
Delft University of Technology

Duration
2022 – 2026

Consortium
University of Witwatersrand,
Delft University of Technology,
University of Venda, Wits
Mining Institute, Gauteng
City-Region Observatory (GCRO), Iyer, IHE Delft Institute for Water Education, Studio Hartzema, Urbaniahoeve

Key words
Ecosystem participation, Post-extraction visions, Transitions, Water and landscape urbanism, Sustainable future

Disciplines
Urban studies, Cultural history, Art and architecture, History of technology, Architecture, Civil engineering, Geodynamics, Sedimentation, Tectonics, Geomorphology

Summary
The reclamation of post-extraction landscapes is a global issue and intertwined with the WEF nexus. This project proposes the concept of ‘ecosystem participation’, which is explored as a combination of Longue Durée and Reversed Engineering with Nature, as a tool for highlighting, preserving and repurposing post-extraction landscapes in relation to the WEF nexus. Understanding the changing roles and relations of water, energy and food in these landscapes allows for reactions to the history of extractions, its present impact and future transitions away from it. Through this concept a solid base of Longue Durée and Reversed Engineering with Nature can guide design for a sustainable future.

By mapping the spatialised relations of natural and cultural conditions, historically informed design acts to inform and reconnect users with former extraction sites, while fostering a greater understanding and awareness of the intertwined nature of mining, landscape and the history of WEF resources. The aim is to create a research and design community, theoretical foundation, methodological approach and learning matrix in which the spatial dynamics and Longue Durée interactions between water, energy, and food are analysed in extractive and post-extractive contexts to inform an interdisciplinary vision for sustainable futures.
## Ecological Community Engagements: Imagining sustainability and the Water-Energy-Food Nexus in urban South African environments (Eco-Imagining)

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<th>South African Principal Investigator</th>
<th>Consortium</th>
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<th>Disciplines</th>
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<tr>
<td>Prof. Lenore Manderson, University of the Witwatersrand</td>
<td>University of the Witwatersrand, University of Amsterdam, University of Limpopo, University of Fort Hare, Ruliv, Rand Water, Hannelie Coetzee Visual Art, Gender CC, South African Weather Service (SAWS), IHE Delft Institute for Water Education, University of Groningen, Research Center for Material Culture</td>
<td>Community-led programmes, Ecological and social innovation, Local knowledge, Participatory methods, Transdisciplinary research</td>
<td>Cultural anthropology, Geography, Art and architecture, Development Studies, Ecology</td>
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### Duration
2022 – 2026

### Summary

Water, energy and food insecurity and precarity, synthesised as the Water-Energy-Food (WEF) Nexus, highlight the need for creative imagining, using a transdisciplinary approach to engage critically with these complex problems. To discover and understand the imaginations and innovations that could steer us to a sustainable future, we propose to work in very local, urban contexts, where WEF challenges reflect the legacies of Apartheid and colonialism. Through community engagement and citizen science labs, we will use a case study of systems thinking in practice to advance socio-political understandings of responses to complex, interconnected but spatially and temporally dispersed problems, and critique discourses of resilience, resourcefulness and sustainability. Citizen Eco-Labs and Art-Labs in Johannesburg (Gauteng), Mankweng (Limpopo), and Alice and East London (Eastern Cape) will enable us to describe community-based understandings of WEF precarity and its particular impact for women and youth. We will generate new knowledge of responses and actions to such precarity, and analyse how ongoing collaborations among community members, local organisations, and multiple public and private partners enable socially inclusive, eco-cultural responses to the environment.

We aim to work with local residents and draw on their understandings of the WEF Nexus, through participatory methods of engagement, to develop guidelines for best practice for partnerships that can contribute to improving livelihoods, the environment and wellbeing.
Through our research, the community is now convinced that they themselves can take action to solve the problems they face. And they know what to do because the solutions are their own. This is not the voice of a university researcher who spends her days at a computer on campus, but Nkarabeleng Matabane, a young woman of 22 who lives in Moyaneng, a village in Matatiele in South Africa. Matabane is a co-researcher on a research project funded by the NRF and NWO on how communities manage resources such as water, food, and energy.

The village where Matabane lives depend on open wells for drinking water, and these are often polluted by stray waste. The dirty water makes people sick. In addition, there is little water in the wells. This is due to drought caused by climate change and due to an advancing exotic tree species, wattle, which sucks up a lot of the groundwater.

Solutions

‘One solution is to cut down the wattle, which will bring more water into the springs and improve the grassland for the cattle,’ says Matabane. Another solution is to keep the wells clean by not letting cattle drink from them. And also by not using disposable nappies but reusable ones, which create no waste.

The research was set up by Utrecht University and the University of Groningen in the Netherlands, and the University of Fort Hare and North-West University in South Africa. ‘It is transdisciplinary and focused on impact,’ says the Dutch Co-Principal Investigator Marjanneke Vijge. ‘We want to empower youth and women in the management of water, food, and energy, thus contributing to social justice. That’s why we involved the community as much as possible. Through a NGO in the...
‘What makes the Ecochamps unique is that they themselves come from the community and know what is appropriate and acceptable in that culture.’

Saul Ngarava, co-investigator on the project

region, we found people in the community to do the research with us.’ Twelve of these so-called Ecochamps, were involved in the research. Ecochamps are members of the community who had already been working with the NGO Environmental and Rural Solutions.

Careful approach

The Ecochamps were given the role of co-researchers. They advised on which questions to ask in surveys, conducted the surveys, and helped to interpret the results. Matabane: ‘I advised against asking questions that were too personal. The researchers planned to ask about household income or the number of cattle villagers keep. I said no, you shouldn’t do that. People will think you want to send thieves to them.’ Matabane also ensured that community members were approached with respect. ‘In the past, researchers came into the village and walked into people’s yards uninvited,’ Matabane says. ‘You shouldn’t do that. We always sought permission first from the chief, the traditional leader of the village.’ Afterwards, the results were discussed with the village council. As a result, the community took up many of the proposed solutions.

‘Without the Ecochamps, we wouldn’t have managed this,’ says Saul Ngarava, co-investigator on the project. Ngarava previously worked at the University of Fort Hare and is now a postdoc at Utrecht University. ‘What makes the Ecochamps unique is that they themselves come from the community and know what is appropriate and acceptable in that culture.’ That way research can find solutions that make a real impact, Ngarava says.

Read the full interview at: www.nwo.nl/mfsouthafrica
Project information:
See next page and www.wefcommunities.co.za
Water-Energy-Food communities in South Africa: multi-actor nexus governance for social justice?

South African Principal Investigator
Prof. Willemien du Plessis, North-West University

Dutch Principal Investigator
Dr Marjanneke Vijge, Utrecht University

Duration
2021 – 2024

Consortium
Utrecht University,
North-West University,
University of Groningen,
University of Fort Hare,
World Wide Fund for Nature (WWF) South Africa

Key words
Multi-actor governance,
Legal frameworks,
Communities, Social justice,
Water-energy-food nexus

Disciplines
Development studies,
Environmental science,
Constitutional and administrative law,
International and European law

Summary

The Water-Energy-Food (WEF) nexus is gaining scholarly and policy attention. Despite growing evidence on which type of nexus governance works, little is known about the consequences of such governance for social justice. Implementing the nexus requires decision-making about trade-offs between the use and production of water, energy and food, which are particularly acute at household and community levels. This raises justice questions of whether the nexus can benefit all, and who makes decisions and at what levels. In South Africa, where access to water, energy and food are strongly influenced by a history of Apartheid and inequality, there is a need to study the challenges and opportunities of a socially just nexus implementation from the bottom up. This research introduces the concept of WEF communities, inspired by EU legislation for energy communities to produce their own renewable electricity. We study how similar communities in South Africa could be legally recognised and expanded to include water use and food production, and with what consequences for social justice, particularly for the poorest and women. Incorporation of WEF communities in South Africa’s legal frameworks may enhance social justice from the bottom up, yet this is uncertain given inequalities in (legal) access to energy, water and land. The project consists of (comparative) analyses of legal frameworks in the EU and South Africa, as well as household assessments on WEF interlinkages and decision-making in two communities in the Eastern Cape and Northern Cape. Data is collected through literature review, surveys, focus group discussions, interviews and fieldshops. Through active participation in the research, stakeholders from the community to the national level will build capacity and connections, including through a ‘training of trainers’ programme targeting the poor, women and youth. Outreach happens through publications, workshops, a website, a symposium and local WEF nexus festivals.
**Spatial inequality in water-energy-food security in South Africa; Implications for public health and the consequences of climate change**

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<td>Prof. Neill J. Goosen, Stellenbosch University</td>
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<td>Climate change, Water-Energy-Food Nexus, Spatial inequality, Public health, Resilience</td>
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<td>Dutch Principal Investigator</td>
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<td>Disciplines</td>
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<tr>
<td>Dr Floor van der Hilst, Utrecht University</td>
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<td>Environment sciences, Development studies, Earth sciences, Geography, Medicine</td>
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**Summary**

South Africa is one of the most unevenly developed countries in the world. About 33% of South Africa's population lives in rural areas with limited access to basic services such as clean and safe water, affordable and clean energy, and balanced and nutritious diets. This is exacerbated by climate change and has direct and indirect impacts on public health and wellbeing. Therefore, rural communities in South Africa are vulnerable to crises such as the COVID-19 pandemic. This project will assess spatial inequality in water-energy-food (WEF) security and the implications for public health in rural South Africa and how this will be affected by climate change, and will identify future-proof interventions to enhance the resilience of vulnerable rural communities to health crises. It takes a highly interdisciplinary and transdisciplinary approach, drawing from knowledge, methods and tools from natural, social and health sciences and by involving national and local societal partners in the design and execution of the project. This project will deliver a conceptual framework on the relationships between WEF nexus and health and how these are affected by climate change; an in-depth analysis of these relationships in three case study areas; national interactive maps of spatial variation in resource security, projected impacts of climate change and implications for public health; and an inventory of potential interventions to improve WEF security and public health.

These outputs will facilitate the identification of priority areas, integrated policy design considering synergies and trade-offs between sustainable development goals (SDGs), and the implementation of tailor-made future-proof interventions at local and national level. Thereby, this project ultimately aims to contribute to SDG 2 – Zero hunger; SDG 3 – Good health and wellbeing; SDG 6 – Clean water and sanitation; SDG 7 – Affordable and clean energy; SDG 10 – Reduced inequalities; SDG 11 – Sustainable cities and communities, and SDG 13 – Climate action.
Water hyacinths: use them or lose them? Improving human and ecosystem health by bringing the science to the people of Lake Chivero, Zimbabwe

South African Principal Investigator
Prof. Timothy Dube,
University of the Western Cape

Dutch Principal Investigator
Dr Ing. Marloes Penning de Vries,
University of Twente

Duration
2023 – 2027

Consortium
University of the Western Cape,
University of Twente, University of the Witwatersrand, IHE Delft
Institute for Water Education,
Environmental Management Agency, Midlands State
University, Netherlands
Institute of Ecology (NIOO-KNAW)

Key words
Wetlands, Invasive species,
Sustainability, Enteric diseases,
Satellite remote sensing

Disciplines
Environmental science, Ecology,
Geography, Geo-information
science, Planetary health,
Sustainability studies

Summary

Lakes in tropical regions around the world suffer from the infestation of water hyacinth. Its proliferation is attributable to the influx of nutrient-rich waters, as rivers feeding the lakes are polluted with wastewater and run-off of fertiliser and manure from surrounding agricultural fields and husbandry within the catchment. The weed clogs waterways and intakes and affects aquatic life, water availability, transportation, fishing, irrigation, and tourism.

Water hyacinth infestation has implications for human health, as it may facilitate the spread of water-related diseases. While water hyacinth may pose health risks, it has the potential to benefit human livelihoods when exploited for wastewater treatment, as fertiliser, for biofuel production or, when made into handicrafts, as a source of income. A sustainable solution to these issues tackles both water quality deterioration and water hyacinth infestation, and ‘uses’ water hyacinth instead of only attempting to ‘lose’ it. We propose a project that identifies such solutions, applicable and appropriate within the local and cultural context of our study region, Lake Chivero, the main source of drinking water to Harare. We will (1) perform systematic studies of causes and effects of water hyacinth spread based on satellite and empirical data; (2) scientifically investigate water hyacinth exploitation methods, and; (3) engage with stakeholders to co-develop strategies to address the challenges of water quality and water hyacinth.

The project’s impacts will be a more healthy and resilient lake ecosystem, improved wellbeing of people depending on the lake, and more resilient communities at Lake Chivero and other lakes in Sub-Saharan Africa. It will thereby contribute to the achievement of the United Nations Sustainable Development Goals (SDG) related to health (SDG 3), drinking water (SDG 6), and sustainable communities (SDG 11). The project is in line with the South African National Development Plan 2030 and the African Union Agenda 2063.
Pathways to WSEFH Nexus activation through innovative sustainable energy

South African Principal Investigator
Prof. Erika Kraemer-Mbula, University of Johannesburg

Dutch Principal Investigator
Dr Ralph Lindeboom, Delft University of Technology

Duration
2023 – 2027

Consortium
University of Johannesburg, Delft University of Technology, University of the Western Cape, University of Twente, Agricultural Research Council

Key words
Waste(water) processing, Biogas solid oxide fuel cell, Micro-grids, Policy and innovation living labs, WSEFH nexus

Disciplines
Biotechnology, Energy engineering, Systems and control engineering, Innovation management, Stakeholder engagement

Summary
COVID-induced supply-chain disruptions have exacerbated inequalities on a global scale. An energy crisis precipitated by conflict in Ukraine in 2022 has also resulted in unprecedented impacts on access to energy worldwide, affecting the poorest communities hardest. Limited access to basic needs jeopardises communities’ resilience against future shocks. South African marginalised communities are particularly at risk because regular power blackouts undermine their access to clean water, food production and health services.

This project investigates the potential to create more secure energy supplies and, by doing so, improve access to basic services. The project expands the current understanding of the nexus of energy with water and food (known as the ‘WEF nexus’) in recognition of the interconnections between water, sanitation, food and health with energy (or what we call the ‘WSEFH nexus’). Key to the success of this project is the balance between the technical and the facilitatory policy processes. Co-creation is essential, and therefore two living labs will be established as the interface between the academic experts on the technology (experimental biogas SOFC) and policy (transformative innovation policy) and actors in real-life resource-constrained contexts. The innovation lab will build an experimental biogas SOFC as well as a digital twin of the proposed microgrid structure for a community, and develop scenarios using data to model the use of a wastewater-powered micro-grid to provide power for water supplies, agriculture and healthcare solutions.

The policy lab will review relevant policy instruments in close collaboration with conventional and marginalised actors. The resulting scenarios will then be ‘tested’ for viability through workshops to understand the nature of the policy environment. Through these activities, the project team will produce blueprints of innovative microgrids from a WSEFH perspective and associated policy toolkits as main outputs, thereby increasing awareness of the relationship between energy and W,S,F,H access.
Critical connections between agricultural water management and human health, using a Water-Energy-Food (WEF) Nexus approach in South Africa (CONNEXION)

South African Principal Investigator
Dr Aidan Senzanje, University of KwaZulu-Natal

Dutch Principal Investigator
Dr Eline Boelee, Deltares

Duration
2023 – 2027

Consortium
University of KwaZulu-Natal, Deltares, University of Venda, Inkomati-Usuthu Catchment Management Agency (IUCMA), Mpumalanga Department of Health, University of Pretoria, IHE Delft Institute for Water Education, Erasmus University Medical Center

Key words
WEF nexus, Irrigation, Infectious diseases, Nutrition, Modelling

Disciplines
Agricultural water management, Public health, Systems dynamics modelling, Irrigation, Economics, Catchment management, Human nutrition, Epidemiology

Summary

CONNEXION will incorporate health-related features and impacts into water-energy-food (WEF) nexus assessment in the Inkomati-Usuthu water management area in South Africa, an agricultural area vulnerable to climate change. It will assess critical connections between water management, with a focus on agricultural water management, and human health.

CONNEXION will then apply this knowledge to develop an integrated WEF-health nexus approach for decision support to reduce mutual WEF and health risks, improve resilience, and contribute to community livelihoods and human wellbeing. Critical connections between WEF and health have not been explored before. CONNXION, therefore, greatly advances the state of the art. To this end, CONNXION will develop a novel system dynamics model that combines WEF nexus modelling and transmission modelling of four infectious diseases (schistosomiasis, malaria, HIV, COVID-19) and malnutrition in Inkomati-Usuthu, as well as spatial modelling to zoom in on food and nutrition security and water resources for the Crocodile catchment. Central to the methodology are the so-called ‘connecting variables’ that allow interaction between the different models over time. The integrated modelling will provide inputs into a visualisation tool and dashboard for strategising and decision-making, supporting WEF and health managers in their policy and daily practice to account for health consequences and influences, respectively.

The CONNXION consortium includes a multidisciplinary team of researchers and practitioners in WEF nexus thinking, infectious health modelling, and EcoHealth dimensions. A broad range of stakeholders will be involved via participatory analysis and transdisciplinary approaches, leading to the joint identification of desired outcomes, development of scenarios, and selection of measures to improve community livelihoods, health, and resilience.
NRF – Nuffic Doctoral Programme

Scientific co-operation between South Africa and the Netherlands forms a cornerstone of the longstanding bilateral relations between the two countries. Since its beginnings in 2017, the NRF-Nuffic doctoral programme (a doctorate study abroad programme) has contributed to encouraging the next generation of scholars in South Africa and supported strong relations between South Africa and the Netherlands in science and education co-operation.

The programme builds on previous doctoral training initiatives including SANPAD and the Desmond Tutu programme. Since the inception of the programme, 46 grants have been made available to South African PhD candidates to enrol for a full-time (four-year) or joint PhD with Dutch knowledge institutions. Six grantees will complete their studies at the end of 2023. In addition to providing these individual grants, the programme has also strengthened bilateral ties between individual knowledge institutions in South Africa and the Netherlands resulting in various new bilateral agreements.

Ten Dutch institutions and eleven South African universities are actively involved in hosting candidates.

**SA institutions**
- North-West University
- Rhodes University
- Stellenbosch University
- University of KwaZulu-Natal
- University of Pretoria
- University of the Free State
- University of the Western Cape
- Walter Sisulu University
- University of Witwatersrand, Johannesburg
- University of Cape Town
- University of Johannesburg

**NL institutions**
- Tilburg University
- University of Groningen
- University of Twente
- Utrecht University
- Vrije Universiteit Amsterdam
- Leiden University
- Wageningen University & Research
- University of Amsterdam
- Erasmus Medical Centre Rotterdam
- Delft University of Technology
The Netherlands and South Africa have a long history of collaborating in astronomy. Recognising the significant value of such collaboration, NWO, ASTRON, DSI, and NRF established several initiatives to intensify the co-operation and foster mutual growth in the field of astronomy. In 2012, Dutch and South African researchers jointly identified areas of common interest and prioritised strategic research areas, leading to several complementary and coherent long-running programmes supported by NWO and NRF. This partnership has not only broadened our knowledge but also cultivated synergy and advancement in the astronomy field.

**World-Class Telescopes, Shared Ambitions**

The world’s most powerful radio telescope – the Square Kilometre Array (SKA) – is being constructed in the remote deserts of South Africa and Australia. The vibrant South African radio astronomy community is in constant growth due to the strategic investments made by the government. The Netherlands played a pivotal role in the SKA project right from its very beginning in the early 1990s and is – like South Africa – one of the founding members of the SKA Observatory Intergovernmental Organisation.

The bilateral partnership enabled the exploitation of synergies between scientific and technological programmes in the Netherlands and South Africa for SKA preparation. These programmes include the SKA pathfinders LOFAR (Low-Frequency Array) and WSRT-
APERTIF in the Netherlands, and the MeerKAT array with its seven-dish precursor KAT-7 in South Africa. Additionally, there is a collaboration in the framework of the Joint Institute for VLBI ERIC (JIVE), hosted in the Netherlands, in which NRF’s Hartebeesthoek Radio Astronomy Observatory has participated since 2001. Joint opportunities are not limited to radio astronomy. There are also Dutch-South African collaborations in optical and multi-wavelength astronomy. The MeerLICHT telescope, which provides a simultaneous, real-time optical view of the radio sky as observed by MeerKAT, is an excellent example of such a collaboration.

**Astronomy and Enabling Technologies for Astronomy (2012-2023)**

NWO and NRF initiated the Astronomy and Enabling Technologies for Astronomy programme to foster collaboration across the full width of astronomy, including technological developments. The programme funded travel and workshops for teams of scientists in the Netherlands and South Africa to collaborate on research projects of common interest. In total, 13 joint research projects and five individual visits have been funded. Projects focused on five research themes, which were identified in a joint workshop in 2012:

- **HI surveys and science**
  Sarah Blyth (University of Cape Town), Erwin de Blok (ASTRON), Marc Verheijen (University of Groningen)

- **Radio continuum surveys**
  Kurt van der Heyden (University of Cape Town), Huub Röttgering (Leiden University)

- **Astrophysical transients**
  Patrick Woudt (University of Cape Town), Paul Groot (Radboud University)

- **Next-generation algorithms and radio techniques**
  Oleg Smirnov (Rhodes University), Jan Geralt Bij de Vaate (ASTRON), David Davidson (Stellenbosch University)

- **Optical techniques: instrument R&D, data reduction and calibration**
  Steven Crawford (SAAO), Matthew Kenworthy (Leiden University)

**Collaboration in VLBI – towards SKA-VLBI**

Dutch and South African institutes have been collaborating on developing the very long baseline interferometry (VLBI) technique, which uses globally distributed telescope arrays to achieve excellent sensitivity and sharp imaging. Both countries are part of the Joint Institute for VLBI ERIC (JIVE), which hosts the central data processor in Dwingeloo. The contributing radio telescopes in the two countries were located in Hartebeesthoek and Westerbork respectively.

A major outcome of this collaboration was the real-time electronic VLBI (e-VLBI) technique that allows instantaneous data transfer from South Africa and other telescopes to JIVE via dedicated high-bandwidth network connections.

JIVE also collaborated with South African teams to commission KAT-7 as an operational element for VLBI observations. Eventually MeerKAT joined VLBI tests, detecting signals from celestial objects between South African and European telescopes at the JIVE correlator. This success paved the way for the inclusion of additional observatories across Africa, eventually forming the African VLBI Network (AVN). These developments have significantly impacted VLBI, and the next step is to develop SKA-VLBI capabilities.

**DOME – South Africa**

The DOME-South Africa project focused on Data Science, Big Data, and Machine Learning within the context of SKA. It served as an international extension of the DOME project, which was undertaken by ASTRON and the IBM Center for Exascale Technology.

The SKA will provide its users with an unprecedented amount of data. To facilitate data usage, a network of SKA Regional Centres (SRCs) will form the primary interface with the data coming from the telescope. The DOME-South Africa project aimed to create a demonstrator of the data flow between the SKA precursor MeerKAT in Cape Town and a precursor of an SRC in Dwingeloo.
MeerLICHT

Prof. Paul Groot (Radboud University) &
Prof. Patrick Woudt (University of Cape Town)

MeerLICHT (Dutch for ‘more light’) is a wide-field telescope located at the Sutherland station of the South African Astronomical Observatory. It was designed and built in the Netherlands, at Radboud University and the Optical-Infrared Group of NOVA (the Netherlands Research School for Astronomy). The MeerLICHT project combines expertise from the Netherlands, South Africa, and the United Kingdom. MeerLICHT operates fully robotically from Cape Town and the Netherlands.

The scientific purpose of MeerLICHT is to shadow the MeerKAT radio array when it observes the southern skies. The MeerLICHT-MeerKAT combination creates a unique simultaneous optical-radio tandem to study the explosive universe: gamma-ray bursts, fast radio bursts and gravitational wave counterparts, as well as solar-type stars and compact binaries. The MeerLICHT telescope was installed in 2017 and has monitored continuously since early 2019. Since mid-2022 the telescope has been tied to the MeerKAT radio array full-time.

Advancing Technological Frontiers

Joint research initiatives have led to the development of innovative instruments, data analysis techniques, and models that are at the forefront of astronomical exploration. Moreover, through joint workshops, educational programmes, and outreach initiatives, a new generation of scientists has been nurtured. Here we share three stories that have emerged from the Dutch-South African collaboration.

HI Surveys and Science with SKA pathfinders

Prof. Erwin de Blok (ASTRON and University of Groningen)
& Dr Sarah Blyth (University of Cape Town)

The main goal was to co-ordinate the preparation of scientific initiatives at two precursors and pathfinders for the SKA radio telescope: the South African MeerKAT telescope and the Dutch APERTIF-WSRT telescope. Both instruments were still in their development phase during that period, and the project played a pivotal role in facilitating the interaction between instrument design and project conceptualisation. The initiatives within the project were predominantly focused on investigating galaxy evolution through the study of neutral hydrogen gas.

Several extended visits involving Dutch astronomers to South Africa proved valuable in establishing and expanding connections within the South African radio astronomy community. Additionally, South African PhD students were provided with the opportunity to enhance their radio astronomy expertise by visiting ASTRON in the Netherlands.
Building a SA-NL Knowledge Ecosystem

Dr Matthew Kenworthy (Leiden University) & Dr Steven Crawford (SAAO)

The aim of the Beta Pictoris b Ring (bRing) project was to establish a fully automated observatory in South Africa to monitor a unique event taking place during 2017 and 2018. Over the course of 300 days, the region of gravitational influence around the extrasolar planet Beta Pictoris b would move between the Earth and its parent star – Beta Pictoris. This was a unique opportunity to monitor the star’s brightness in order to detect any dust or rings orbiting this gas giant exoplanet. The funding facilitated the students’ exchange to install the washing-machine-sized observatory, South African students’ visits to Leiden, and the Lorentz Centre Workshop in 2016.

The observatory was successfully commissioned in January 2016 and has carried out observations on every clear night. When the data from bRing was combined with data from other telescopes around the world (Australia, Chile) and two space-based observatories (BRITE-Constellation and the Hubble Space Telescope), the research team was able to provide the most sensitive limit to possible circumplanetary discs around one of the nearest exoplanets outside our solar system. The bRing project resulted in multiple scientific publications. Importantly, these interactions have generated further projects and collaborations.

Brightest Cluster Galaxies and Cluster Cores: Understanding a Symbiotic Relationship

Prof. Henk Hoekstra (Leiden University) & Prof. Ilani Loubser (North-West University)

Galaxies form through gravitational merging of smaller structures, with ‘brightest cluster galaxies’ (BCGs) at the core of massive clusters. Professor Hoekstra and collaborators analysed data on massive galaxy clusters, noting trends suggesting a connection between the environment and central galaxies. To delve deeper, they partnered with Professor Loubser, an expert in central cluster galaxy properties. Her expertise proved vital to exploit these unique data and led to a collaboration, which was strengthened by frequent visits.

Using precise velocity measurements from the Gemini telescopes, they probed star formation history and inner region mass contribution, revealing unexpected diversity in BCGs’ dynamical properties.

The open approach, focusing on establishing interactions through visits, was the strength of their programme. The collaboration enabled leveraging of the astronomical infrastructure, e.g., access to ESO telescopes and facilities, the South African telescopes (SALT, MeerKAT), and combined projects (MeerLICHT). These astronomy collaborations also led to more South African postgraduate astronomy students participating in the Dutch-South African scholarship programmes, such as the NRF-Nuffic scholarship.

Put a Ring on It: Looking for Rings around the Exoplanet Beta Pic B.

Dr Matthew Kenworthy (Leiden University) & Dr Steven Crawford (SAAO)

The aim of the Beta Pictoris b Ring (bRing) project was to establish a fully automated observatory in South Africa to monitor a unique event taking place during 2017 and 2018. Over the course of 300 days, the region of gravitational influence around the extrasolar planet Beta Pictoris b would move between the Earth and its parent star – Beta Pictoris. This was a unique opportunity to monitor the star’s brightness in order to detect any dust or rings orbiting this gas giant exoplanet. The funding facilitated the students’ exchange to install the washing-machine-sized observatory, South African students’ visits to Leiden, and the Lorentz Centre Workshop in 2016.

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Orange Knowledge Programme

Although a leading country in the Southern African Development Community, South Africa remains a dual economy with major socioeconomic challenges, particularly in addressing the skills gap. In 2018 the Netherlands’ Orange Knowledge Programme was launched in South Africa with the thematic focus areas of Food and Nutrition Security (Agriculture) and Water. In addition, technical and vocational education (TVET) was identified as a specific focus group within the programme. The programme’s initial duration was from 2018 – 2022 but due to the impact of COVID-19 the programme was extended until 2024, offering further opportunities for Tailor-Made Training and scholarship awards.

Dutch capacity-building programmes prior to the Orange Knowledge Programme (OKP) included the Netherlands Programme for Capacity Building and Training (NPT) and the Netherlands Initiative for Capacity development in Higher Education (NICHE). Both programmes supported and collaborated with the South African Department of Higher Education and Training (DHET). The direct beneficiaries of NPT and NICHE included 21 South African TVET colleges, 350,000 students, and more than 9,000 lecturers, covering more than 50% of the TVET sector. For this reason, the South African government looks to the Netherlands and its TVET system as a preferred partner in future co-operation. Various Agricultural Training Institutes under the South African Department of Agriculture, Forestry and Fisheries (DAFF) were also strengthened under NICHE, focusing on making the curricula more competence-based and aligned to labour market needs. Under NPT and NICHE, the water sector was also strengthened in the areas of Integrated Water Resource Management (IWRM) and wastewater management.

In the field of education, an important challenge is the need to shift the focus from theory to a more practical skills development approach in order to improve labour market participation and tackle youth unemployment. There are interesting opportunities here for public-private partnerships (triple helix). Both countries offer each other opportunities to engage in the further development of sustainable partnerships that address skills development in education, agriculture and water in order to create jobs in the sectors, increase agricultural production to end hunger, create sustainable systems and increase access to water in the cities. South Africa was selected for further collaboration through the OKP due to the country’s:

- imbalanced society in terms of wealth and the participation of the formerly disadvantaged community (lack of inclusiveness);
- need to replace theory-oriented education with skills-development-oriented education for employment creation;
- leading role in the region (SADC);
- opportunities to work with co-funding and innovative triple helix co-operation (collaboration amongst business, academia and government).

In South Africa, the Orange Knowledge Programme focuses on training and skills development in:
- food and nutrition security;
- water management.

The table on the next page provides a snapshot of the projects and activities under the OKP in South Africa.
### Institutional Collaboration Projects

<table>
<thead>
<tr>
<th>Theme</th>
<th>Title</th>
<th>Duration</th>
<th>Budget (EUR)</th>
<th>Dutch partners</th>
<th>Local partners</th>
<th>Sector focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNS</td>
<td>Strengthening the skills component in the agricultural value chain to support increased production and job creation</td>
<td>01/01/2019 – 31/03/2023</td>
<td>999,705 (co-funding 100,000)</td>
<td>Aeres (lead), Wageningen Centre for Development Innovation, HAS University of Applied Sciences, Lentiz, Helicon</td>
<td>Elangeni TVET College, Eisenburg Agricultural College Stellenbosch University</td>
<td>TVET</td>
</tr>
<tr>
<td>Water</td>
<td>Strengthening the skills component in municipalities to support increased access to water and job creation</td>
<td>01/02/2019 – 31/04/2022</td>
<td>774,285 (co-funding 225,000)</td>
<td>TU Delft (lead), World Water Academy, Rotterdam University of Applied Sciences, Centre of Expertise Water Technology Leeuwarden, Waterschap Brabantse Delta</td>
<td>Durban University of Technology, University of Cape Town, City of Cape Town, Water &amp; Sanitation Department, City of eThekwini, Durban-eThekwini Water and Sanitation, SALGA</td>
<td>Higher Education/ Gov</td>
</tr>
<tr>
<td>FNS / TVET</td>
<td>Strengthening skills of TVET staff and students for optimising water usage &amp; climate-smart agriculture in South Africa</td>
<td>01/06/2019 – 31/03/2023</td>
<td>1,269,839 (co-funding 347,850)</td>
<td>MSM (lead), Graafschap College, CINOP Global, Q-Point BV, Acacia Water BV, SaltFarm Texel, AgriColleges International (ACI), Academy for Environmental Leadership (AEL)</td>
<td>Stellenbosch University, through its Water Institute and Faculty of Agriculture, Western Cape Department of Agriculture, Eisenburg Agricultural Training Institute, Boland College, Vhembe TVET College, Motheo TVET College, Nkangala TVET College, Northern Cape Rural TVET College</td>
<td>TVET</td>
</tr>
</tbody>
</table>

### Tailor-Made Training

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topic</th>
<th>Duration</th>
<th>Budget (EUR)</th>
<th>Requesting organisation</th>
<th>Dutch organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNS</td>
<td>Strengthen the livelihoods of the Langrug Community through knowledge and skills development on cultivation and entrepreneurship</td>
<td>01/01/2019 – 13/09/2019</td>
<td>74,924</td>
<td>Langrug Community</td>
<td>Delphy BV</td>
</tr>
<tr>
<td>FNS</td>
<td>Social Impact Management Graduate Programme for Sustainable Climate Smart Conservation Agriculture</td>
<td>01/07/2020 – 30/06/2021</td>
<td>74,722</td>
<td>Environmental Sustainability Agency</td>
<td>Beholding BV</td>
</tr>
<tr>
<td>FNS</td>
<td>Strengthening education for Climate-Smart Agriculture in the Cape region</td>
<td>01/05/2022 – 31/03/2022</td>
<td>74,992</td>
<td>Living Hope</td>
<td>Delphy BV</td>
</tr>
</tbody>
</table>

### Tailor-Made Training plus

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topic</th>
<th>Duration</th>
<th>Budget (EUR)</th>
<th>Requesting organisation</th>
<th>Dutch organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNS</td>
<td>To address the lack of skills of emerging commercial farmers and processors in South Africa</td>
<td>01/10/2020 – 31/03/2022</td>
<td>166,958</td>
<td>Boland College</td>
<td>Q-point</td>
</tr>
<tr>
<td>Water</td>
<td>Partnership to assist the City of Cape Town with water &amp; sanitation challenges in informal settlements during the COVID-19 pandemic and beyond.</td>
<td>01/01/2021 – 31/03/2022</td>
<td>196,655</td>
<td>City of Cape Town, Water &amp; Waste Directorate, Water &amp; Sanitation Department</td>
<td>Centre for International Cooperation – VU</td>
</tr>
</tbody>
</table>
## Refresher Course

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topic</th>
<th>Duration</th>
<th>Budget (EUR)</th>
<th>Requesting organisation</th>
<th>Dutch organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNS / Water</td>
<td>Making Southern African cities greener in a time of climate change: Strategies to reduce water and food production vulnerabilities caused by water extremes</td>
<td>12/10/2020 – 23/10/2020</td>
<td>74,998 (co-funding 8,019)</td>
<td>South African Council of Planners (SACPLAN) and Ekurhuleni Metropolitan Municipality Planning Division</td>
<td>Erasmus University Rotterdam</td>
</tr>
</tbody>
</table>

## Scholarships – Overview per year

<table>
<thead>
<tr>
<th>Type of scholarship</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master</td>
<td>15</td>
<td>20</td>
<td>18</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Short course</td>
<td>31</td>
<td>29</td>
<td>21</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>

## Annual breakdown indicating Gender and Thematic division

(Thematic division for stakeholders is in the following areas: Food, Nutrition & Security + Water)

<table>
<thead>
<tr>
<th>2018</th>
<th>Type of scholarship</th>
<th>Total</th>
<th>Gender (F/M)</th>
<th>FNS</th>
<th>Water</th>
<th>SRHR</th>
<th>SRoL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Master</td>
<td>15</td>
<td>7/8</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Short course</td>
<td>31</td>
<td>21/10</td>
<td>13</td>
<td>7</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2019</th>
<th>Type of scholarship</th>
<th>Total</th>
<th>Gender (F/M)</th>
<th>FNS</th>
<th>Water</th>
<th>SRHR</th>
<th>SRoL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Master</td>
<td>20</td>
<td>13/7</td>
<td>3</td>
<td>17</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Short course</td>
<td>29</td>
<td>18/11</td>
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<th>Total</th>
<th>Gender (F/M)</th>
<th>FNS</th>
<th>Water</th>
<th>SRHR</th>
<th>SRoL</th>
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<th>FNS</th>
<th>Water</th>
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<th>SRoL</th>
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<tr>
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<td>Master</td>
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<th>FNS</th>
<th>Water</th>
<th>SRHR</th>
<th>SRoL</th>
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</thead>
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<td>7/4</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Short course</td>
<td>9</td>
<td>6/3</td>
<td>3</td>
<td>7</td>
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A highlight of this co-operation is that the ties between South Africa and the Netherlands are founded from our historical bonds. Whether the government intervenes in enabling the co-operation between the two countries or not, there is a natural connection at various spheres of our relations – be it at academia or industry level. Individuals and corporates are keen to collaborate with each other and that is a big highlight and positive in our relations.

There are also opportunities for the two countries to join forces and collaborate further in addressing societal challenges, such as those that relate to climate change. The world is going through a shift in addressing some of our existential challenges as a planet and collaboration across borders is necessary to address these.

As part of a national drive to create a clean, affordable and sustainable energy future for South Africa, the South African government (through the Department of Science and Innovation) launched the Hydrogen Society Roadmap (HSRM) in February 2022. Science Diplomacy for Economic Development through Hydrogen is an initiative of DSI’s International Office and the Hydrogen Energy Chief Directorate that seeks to directly support both the HSRM and the draft Hydrogen Commercialisation Strategy of South Africa by holding a series of local and international roundtable workshops and follow-up engagements.

The key objectives of these workshops are to:
- Identify new spin-off projects in order to set up first tangible parts of the hydrogen value chain (Involving SME’s and multinationals) in the selected areas
- Establish the requirements for putting in place all enablers of the hydrogen value chain: education (skilling and reskilling), job strategies, policy framework and (international) partnerships
- Impact by design: identifying where, in the hydrogen value chain, can South Africa attract international partners for collaboration and
- Establish how South Africa can develop its domestic hydrogen market while becoming a preferred supplier to global markets (Africa at large, EU, America and Asia).

The implementing partners for the roundtables in Europe are the DSI Brussels Office, Stellenbosch University and Impact Hydrogen from the Netherlands. Through the roundtables held thus far, tremendous strides have been made in advancing the relations between the two countries.

There have also been exchanges at the Heads of State level where commitments were pronounced for the two countries to work together in the Hydrogen Economy. We look forward to strengthening our collaboration in these areas.
Erasmus Mobility

Funding through the European Union is available for research (Horizon), mobility (Erasmus+) and capacity building. South African and Dutch institutions actively engage with the funding opportunities.

Mobility (Erasmus+)

The Erasmus+ KA171 International Credit Mobility Project enables project-based student, doctoral and staff mobility to specific countries outside the EU, for example South Africa. This creates opportunities for South African and Dutch Higher Education Institutions (HEIs) to collaborate.

2022

<table>
<thead>
<tr>
<th>Requested South Africa (in €)</th>
<th>621,188</th>
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<tbody>
<tr>
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<td>493,674</td>
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<tr>
<td>Total number of granted mobilities</td>
<td>99</td>
</tr>
<tr>
<td>– Of which students</td>
<td>37</td>
</tr>
<tr>
<td>– Of which staff</td>
<td>62</td>
</tr>
<tr>
<td>Percentage outgoing mobilities (to SA)</td>
<td>33%</td>
</tr>
<tr>
<td>Percentage incoming mobilities (to NL):</td>
<td>67%</td>
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</table>

Collaborating HEIs

- VU Amsterdam
- University of Leiden
- Erasmus University Rotterdam
- Hogeschool Rotterdam
- Utrecht University
- University of Groningen
- Rhodes University, University of Johannesburg, University of Venda
- University of KwaZulu-Natal
- University of Cape Town
- Stellenbosch University, University of Pretoria, University of Witwatersrand Johannesburg
- Stellenbosch University, University of Cape Town, University of the Western Cape

2023

<table>
<thead>
<tr>
<th>Requested South Africa (in €)</th>
<th>1,031,402</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awarded South Africa (in €)</td>
<td>157,580</td>
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<tr>
<td>Total number of granted mobilities</td>
<td>42</td>
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<tr>
<td>– Of which students</td>
<td>10</td>
</tr>
<tr>
<td>– Of which staff</td>
<td>32</td>
</tr>
<tr>
<td>Percentage outgoing mobilities (to SA):</td>
<td>36%</td>
</tr>
<tr>
<td>Percentage incoming mobilities (to NL):</td>
<td>64%</td>
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</tbody>
</table>

Collaborating HEIs

- Aeres
- InHolland
- Tilburg University
- University of the Free State
- North-West University (Mahikeng)
- Noordwes-Universiteit
## Capacity Building in Higher Education (CBHE)

These capacity-building projects in the field of higher education are transnational co-operation projects, based on multilateral partnerships, primarily between higher education institutions from EU member states or countries associated with the Erasmus+ Programme and third countries not associated with the Erasmus+ Programme, such as South Africa.

### CBHE Call 2023

For the CBHE Call 2023, there are two newly-awarded projects that involve Dutch and South African institutions.

**‘NbS4AfrRes – Nature-based Solutions for African Resilience’ project**

<table>
<thead>
<tr>
<th>Co-ordinator</th>
<th>South Africa</th>
<th>Rhodes University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner</td>
<td>South Africa</td>
<td>University of Cape Town</td>
</tr>
<tr>
<td>Partner</td>
<td>Senegal</td>
<td>Université Cheikh Anta Diop de Dakar</td>
</tr>
<tr>
<td>Partner</td>
<td>Netherlands</td>
<td>Delft University of Technology</td>
</tr>
<tr>
<td>Partner</td>
<td>Senegal</td>
<td>Ecole Polytechnique de THIES</td>
</tr>
<tr>
<td>Partner</td>
<td>France</td>
<td>Institut national des sciences et industries du vivant et de l’environnement – AgroParisTech</td>
</tr>
<tr>
<td>Affiliated</td>
<td>France</td>
<td>Institut national de recherche pour l’agriculture, l’alimentation et l’environnement</td>
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</table>

**‘BAQONDE – Boosting the Use of African Languages in Education. A Qualified Organized Nationwide Development Strategy for South Africa’ project**

https://baqonde.usal.es

<table>
<thead>
<tr>
<th>Co-ordinator</th>
<th>Spain</th>
<th>Universidad de Salamanca</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner</td>
<td>Ireland</td>
<td>Trinity College Dublin</td>
</tr>
<tr>
<td>Partner</td>
<td>Netherlands</td>
<td>University of Groningen</td>
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</table>

### CBHE Call 2020

One project was awarded that involves South African and Dutch institutions.

**‘SANA+, Dirisana+ - Strengthening of relations between HEIs and the wider economic and social environment’ project**

dirisanaplus.wordpress.com

<table>
<thead>
<tr>
<th>Co-ordinator</th>
<th>South Africa</th>
<th>University of Pretoria</th>
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</thead>
<tbody>
<tr>
<td>Partner</td>
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<td>University of Turku</td>
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<tr>
<td>Partner</td>
<td>Ireland</td>
<td>University College Dublin, National University of Ireland</td>
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<td>Partner</td>
<td>Namibia</td>
<td>University of Namibia</td>
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<td>Partner</td>
<td>Namibia</td>
<td>Welwitschia University (PTY) LTD</td>
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<td>Partner</td>
<td>Netherlands</td>
<td>Maastricht University</td>
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<tr>
<td>Partner</td>
<td>South Africa</td>
<td>Sefako Makgatho Health Sciences University</td>
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<tr>
<td>Partner</td>
<td>South Africa</td>
<td>University of the Witwatersrand, Johannesburg</td>
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</table>
NWO
The Dutch Research Council (NWO) is one of the most important science funding bodies in the Netherlands. Each year, NWO invests almost €1 billion in curiosity-driven research, research related to societal challenges, and research infrastructure. As a cross-domain initiative within NWO, WOTRO Science for Global Development programmes finance and facilitate research for inclusive global development. WOTRO is responsible for the implementation of the Merian Fund calls, which includes the bilateral research programme with the NRF and focuses on the Water-Energy-Food Nexus.
For more information see www.nwo.nl.

Nuffic
Nuffic is the Dutch organisation for internationalisation in education, from primary and secondary education through to vocational and higher education, research and adult education. We believe that education is the engine of growth, everywhere. Our global development policy is therefore based on strengthening the competencies and skills of both individuals and organisations through education, in the Netherlands and abroad. Economic, political and social tensions do not stop at national borders. In South Africa Nuffic is represented by a local office – Nuffic Southern Africa.
For more information see www.nuffic.nl.

NRF
The National Research Foundation (NRF) funds research, the development of high-end Human Capacity, and critical research infrastructure to promote knowledge production across all disciplinary fields. The goal is to create innovative funding instruments, advance research career development, increase public science engagement, and establish leading-edge research platforms that will transform the scientific landscape and inspire a representative research community to aspire to global competitiveness.
The NRF promotes South African research and innovation interests across the country and internationally. In addition, the NRF works with research institutions, business, industry and international partners to build bridges between research communities for mutual benefit that contributes to National Development.
For more information see www.nrf.ac.za.

Dutch Education & Science Counsellor, Embassy of the Kingdom of the Netherlands
The Dutch Ministry of Education, Culture & Science has prioritised South Africa as one of the eight countries worldwide in which it aims to strengthen co-operation on education and science. Education & Science Counsellor Berto Masibulele Bosscha is based at the Embassy of the Kingdom of the Netherlands in Pretoria. His goal is to strengthen existing networks and explore new opportunities for co-operation, exchange and policy learning. He can be contacted at berto.bosscha@minbuza.nl.

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