



UNIVERSITY OF THE FREE STATE, IN COLLABORATION WITH UNIVERSITIES SOUTH AFRICA

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UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA



UNIVERSITIES
SOUTH AFRICA

- SDG1 - NO POVERTY
- SDG2 - ZERO HUNGER
- SDG 3 - GOOD HEALTH AND WELLBEING
- SDG 4 - QUALITY EDUCATION
- SDG 5 - GENDER EQUALITY
- SDG 6 - CLEAN WATER AND SANITATION
- SDG 7 - AFFORDABLE AND CLEAN ENERGY
- SDG 8 - DECENT WORK AND ECONOMIC GROWTH
- SDG 9 - INDUSTRY, INNOVATION AND INFRASTRUCTURE
- SDG 10 - REDUCED INEQUALITIES
- SDG 11 - SUSTAINABLE CITIES AND COMMUNITIES
- SDG 12 - RESPONSIBLE CONSUMPTION AND PRODUCTION
- SDG 13 - CLIMATE ACTION
- SDG 14 - LIFE BELOW WATER
- SDG 15 - LIFE ON LAND
- SDG 16 - PEACE, JUSTICE AND STRONG INSTITUTIONS
- SDG 17 - PARTNERSHIPS FOR THE GOALS



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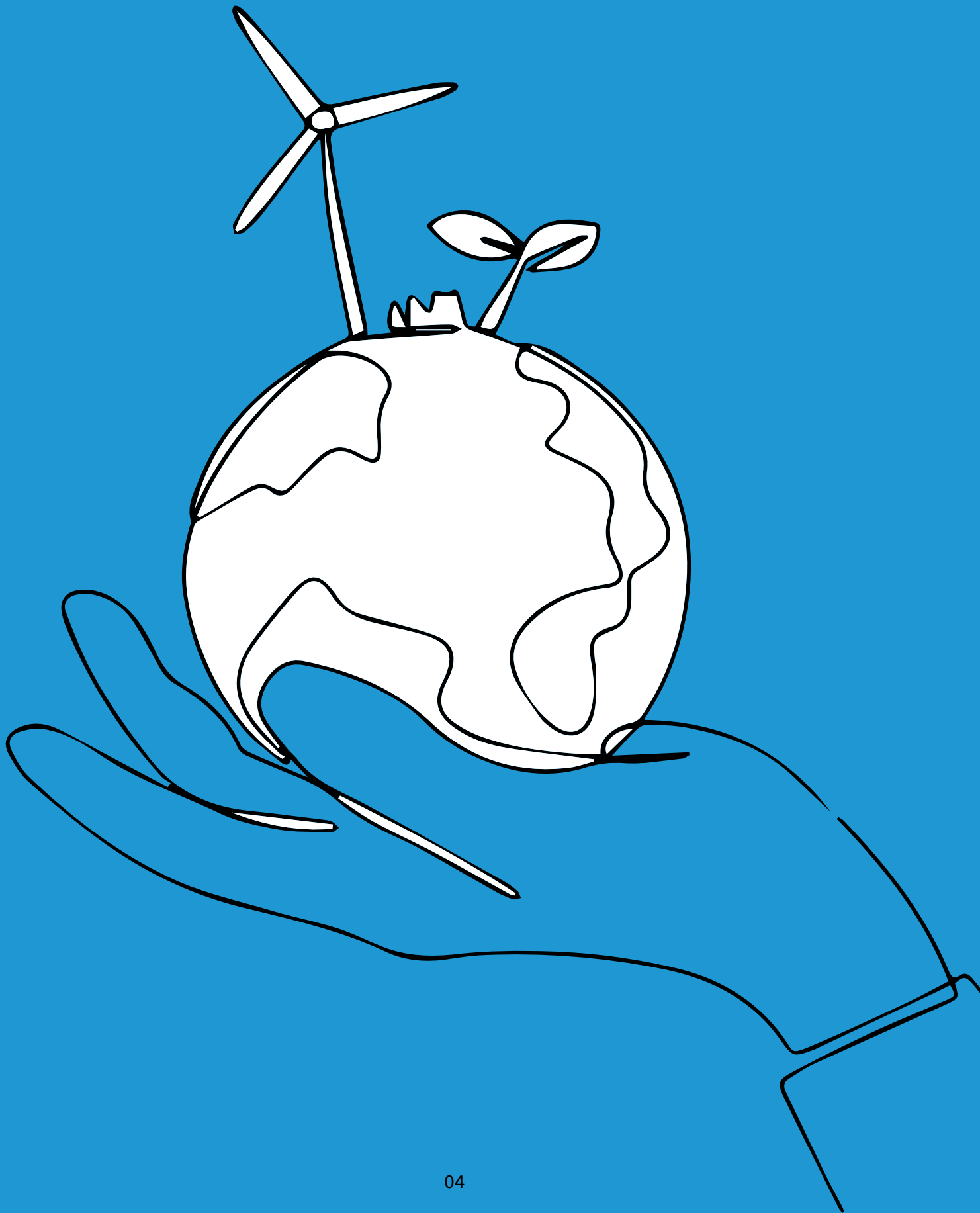
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INTROD



RODUCTION AND BACKGROUND

Universities South Africa (USAf) commissioned a call for a research project aimed at mapping the contribution that tertiary institutions in South Africa are currently making towards addressing the Sustainable Development Goals (SDGs), identifying gaps and opportunities where contributions could be made, and exploring the role of synergistic partnerships among the institutions to accelerate progress made in addressing widening inequalities in South Africa. The project was awarded to the University of the Free State (UFS) as it is uniquely positioned to partner with USAf in conducting the research study due to the pivotal role it already plays in addressing sustainable development challenges in the South African context. With a particular focus on food security and sustainable food systems, the research team from the UFS Department for Sustainable Food Systems and Development have the appropriate experience and is ideally qualified to conduct the proposed research study ¹. The USAf-approved UFS research proposal framed the study as a comprehensive mapping exercise primarily informed by desktop research, with online focus group discussions to triangulate and confirm findings. Due to the challenges of obtaining gatekeepers' approval to conduct focus group discussions at all 26 universities, the project was amended and approved by the USAf Steering Committee. It now includes feedback from the DVCs Research at the 26 institutions on the specific university SDG mapping results.

AIMS AND OBJECTIVES

The UFS is collaborating with USAf and its Research and Innovation Strategy Group (RISG) in conducting the mapping exercise with the following aims:

Identify strengths and opportunities in South Africa's 26 public universities for contributing to the SDGs;

1

Identify strategic gaps and/or emerging opportunities not being addressed but which universities might want to develop based on their strategic direction and needs in their geospatial location to inform differentiated and tailored solutions;

2

Collect examples that provide different aspects of Science, Technology, and Innovation (STIs) initiatives accelerating the attainment of SDGs;

3

Gather examples of sustainable partnerships contributing to addressing the SDGs both nationally and internationally and;

4

Highlight where institutions have overlapping and complementary strengths that can possibly be combined in synergistic partnerships that will accelerate finding solutions to South Africa's most pressing sustainable development challenges.

5

RESEARCH QUESTIONS

The project aims to address the following research questions:

01 How can the strengths and opportunities within South African universities be utilised to address relevant SDGs and close the gap between the widening inequalities in South Africa?

02 Are there overlapping strengths and opportunities within South African universities that can be combined to form synergistic partnerships to address the most pressing sustainable development challenges expeditiously?

03 Which areas can still be developed to attain the SDGs relevant to South Africa to close the gap between the widening inequalities in South Africa?

04 Are there current sustainable partnerships within local and/or international tertiary institutions that can address SDGs and inequalities within South Africa?



LITERATURE REVIEW



Given the complex challenges facing the planet, sustainable development, defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”², has been at the forefront of the global discourse. Poverty, inequality, unemployment, conflict, terrorism, and violent extremism are rife and have been exacerbated by global health threats like the COVID-19 pandemic. Furthermore, the depletion of our natural resources, environmental degradation, and loss of biodiversity threaten to reverse any progress made towards ensuring greater prosperity in recent decades³⁻⁵. The situation is further complicated by the fact that we face these challenges in an uncertain environment due to global climate change. Soaring temperatures, rising sea levels, and an unprecedented increase in natural disasters threaten our current existence^{4,6,7}.

In 2015, the United Nations launched the 2030 Agenda for Sustainable Development at a UN Summit, identifying 17 Sustainable Development Goals (SDGs) that need to be reached if the world is to address the wicked challenges facing humanity and secure a sustainable future for all. Grouped under the five main themes of people, planet, prosperity, peace, and partnerships, the SDGs are a global call to action and provide a framework for countries to guide their development priorities and activities⁴.

Higher education institutions have a pivotal role to play in assisting governments and private sectors to reach the SDG targets. As the primary vehicles for human resource development, higher education institutions are responsible for educating the next generation of leaders who will be tasked with tackling sustainability challenges. Higher education institutions need to educate their students so that they have sufficient sustainability-related knowledge and skills to find solutions to the wicked problems facing humanity today⁸⁻¹¹. Apart from their vital role in educating the future workforce, higher education institutions also contribute to sustainable development through outreach activities^{12,13}, the economic impact of commercialised university research inventions¹⁴, and the impact of research on policy, business practice, and society¹⁵. Furthermore, partnerships between higher education institutions to address the SDGs are becoming more prevalent and have shown to be highly beneficial¹⁶. This is not surprising since the multidimensional nature of the 17 SDGs requires approaches drawing on wide-ranging strengths very rarely available in a single institution.

Although there is ample evidence that tertiary institutions in South Africa address the SDGs in their education, research, and engagement activities, no comprehensive study has been done on mapping the overall contribution of the higher education sector to achieving the SDGs in South Africa. The study proposed in the call by USAf is timely, given the important role of higher education institutions in this regard. Mapping the contribution of South African higher education institutions presents an opportunity to identify institutional strengths that have already been utilised but have not yet been tapped into and that can be used in the future to achieve the SDG goals. In addition, comprehensively mapping the contribution of South African tertiary institutions will highlight the potential for synergistic cooperation between institutions to accelerate the country's transition towards prosperity for all.

RESEARCH DESIGN AND METHODOLOGY

Desktop research, also known as secondary research, was the primary research strategy followed. Qualitative and quantitative data from university annual and research reports, websites and publications, as well as data drawn from SciVal using the Elsevier database, was gathered and mapped against the SDGs. Findings from the mapping exercise were quantified, and dashboards were created to show the extent of overlap with the SDGs for each institution and highlight the strengths and opportunities within and across institutions. Through feedback from the DVCs Research at the 26 universities, qualitative data was gathered to verify and triangulate the findings resulting from the mapping exercise. As requested by USAf, feedback from the DVCs Research was qualitatively analysed by members of the University of Venda, with Prof Ademola Jegede as the lead researcher.

RESEARCH ETHICS

Care was taken to ensure that the Protection of Personal Information Act (POPIA) was not violated in any way through the data gathering and analysis processes. The researchers gathered and mapped information already available in the public domain. Ethics approval was applied for through the General Human Research Ethics Committee (GHREC) at the UFS, and approval was granted with the Ethics Clearance Number: UFS-HSD2024/0107.

RESULTS

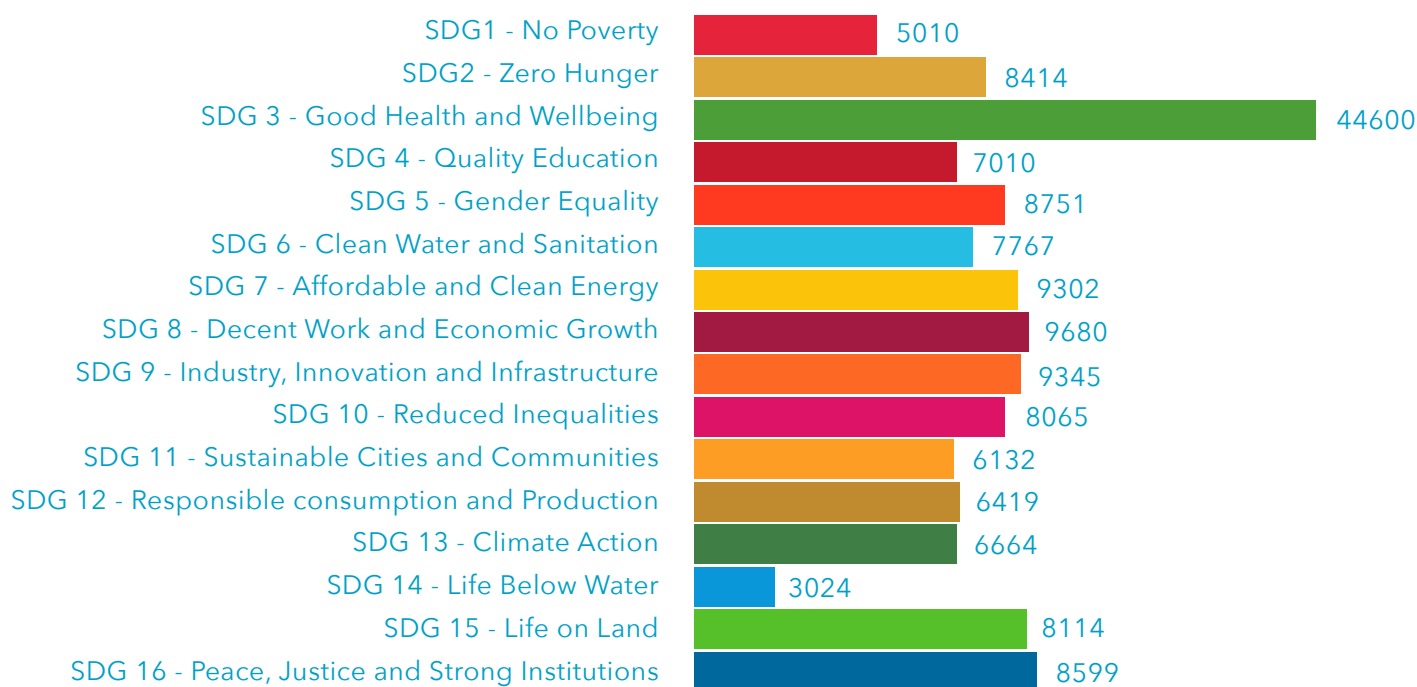
Two online research platforms, SciVal¹⁷ and the European Commission's SDG mapping tool¹⁸, were used to gather data on the research performance and contributions to the SDGs of the 26 universities in South Africa. Both tools use a set of keywords or search queries to map publications and documents according to the 17 SDGs.



Research publications (Total research outputs)

According to data gathered from SciVal for a six-year period (2018 – 2023), there were 156,896 total research outputs that addressed the first 16 SDGs. SDG 3 Good Health and Wellbeing is the SDG that is addressed the most in publications, with a significant 44 600 publications in total, followed by SDG 8 Decent Work and Economic Growth (9 680 publications in total), SDG 9 Industry, Innovation, and Infrastructure (9 345 publications in total), SDG 7 Clean and Affordable Energy (9 302 publications), and SDG 5 Gender Equality (8 751 publications) (Figure 1)

Figure 1 - Total contributions to the SDGs through total research outputs by South African Universities.



SDG 13 Climate Action (6 664 publications), SDG 12 Responsible Consumption and Production (6 419 publications), SDG 11 Sustainable Cities and Communities (6 132 publications), SDG 1 No Poverty (5 010 publications) and SDG 14 Life Below Water (3 024 publications) were the five SDGs least addressed by total research outputs from South African universities.

According to the World Bank Group ¹⁹, more than half of the South African population (55,5%) lives in poverty. It is thus of utmost importance for South African universities to focus on and increase their contribution to SDG 1 to eliminate poverty in South Africa. Given the geospatial location of some of the universities in South Africa and their involvement in research networks such as the South African Environmental Observation Network (SAEON), SDG 14 Life Below Water creates an opportunity for South African universities to make a significant contribution to the attainment of Agenda 2030 with universities such as Rhodes University, Nelson Mandela University, and the University of Cape Town taking the lead.

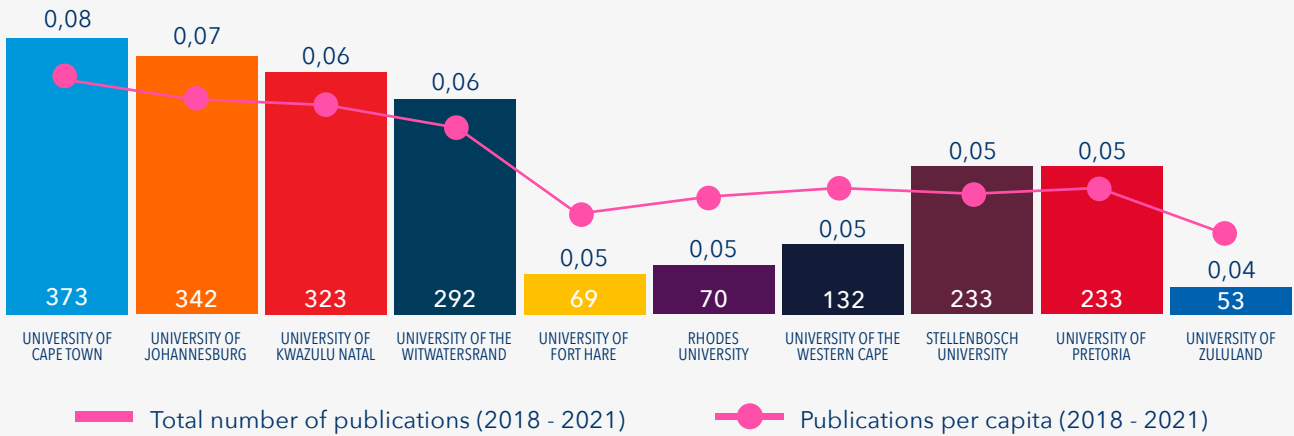
When we compared the 26 universities with each other to identify strengths and opportunities, per capita publications were calculated to gain more granular data. Data on the headcount of instructional or research staff for 2022 was unavailable at the time of the data collection. The data in Table 1 below shows the top ten contributors to the individual SDGs, containing data for four years from 2018 to 2021.

The University of Johannesburg is the strongest contributor to the attainment of seven of the first 16 SDGs through total research outputs, followed by the University of Cape Town, contributing to four of the first 16 SDGs. Although relatively small, Rhodes University is a significant contributor to the attainment of the SDGs by being in the top ten contributors for 14 of the first 16 SDGs. Rhodes University is the top contributor to two of the SDGs, namely SDG 14 Life Below Water and SDG 15 Life on Land.

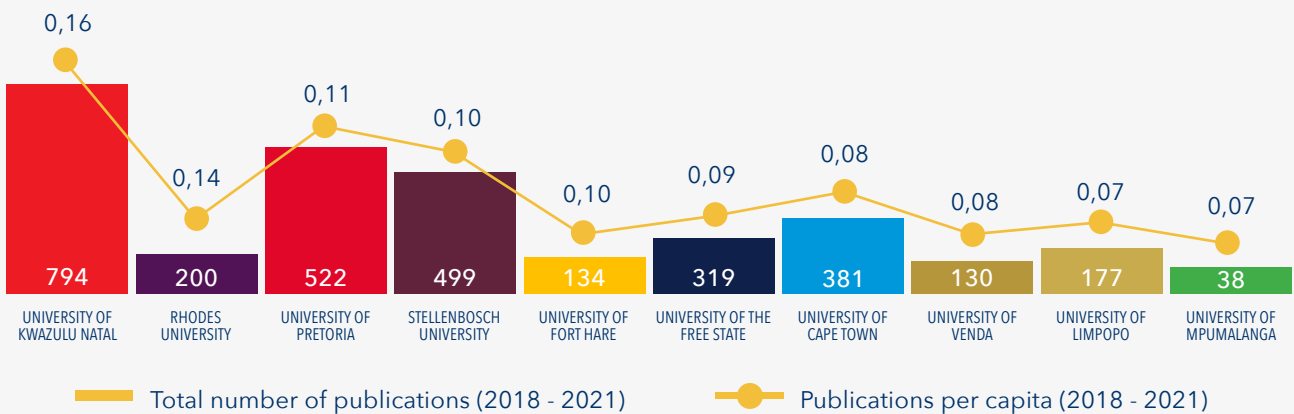
TABLE 1

Total research outputs per university for each of the first 17 SDGs for the period 2018 to 2022.

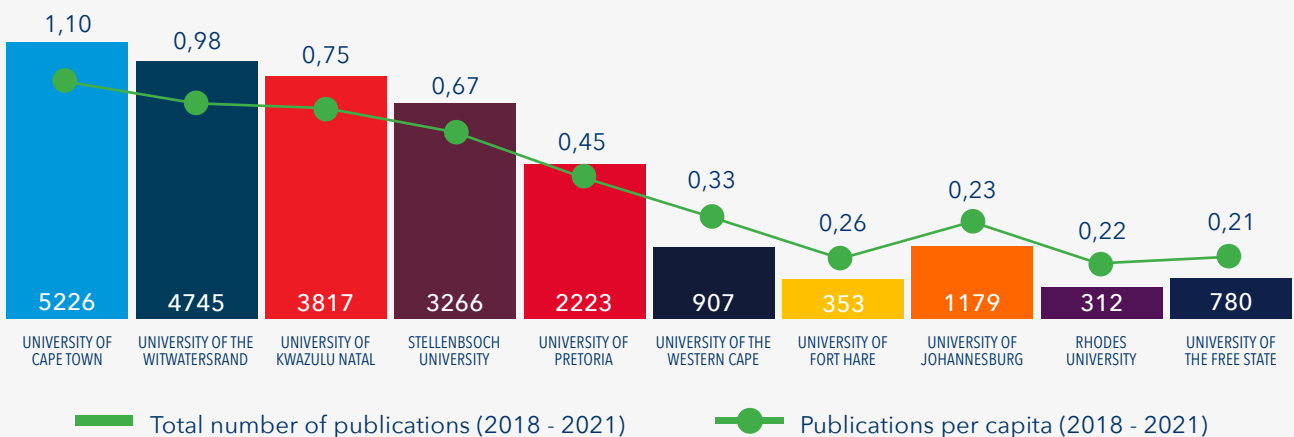
SDG 1: NO POVERTY - Total number of publications | Publications per capita - 2018 - 2021



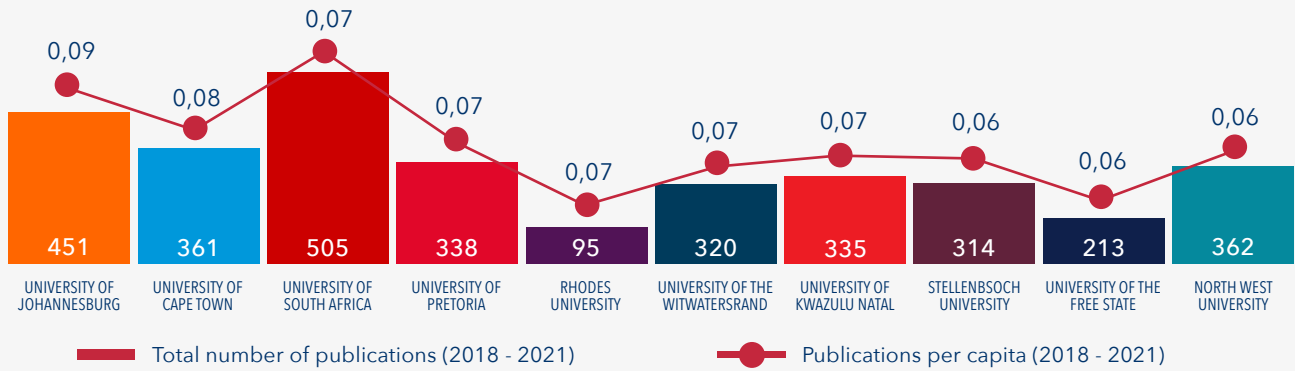
SDG 2: ZERO HUNGER - Total number of publications | Publications per capita - 2018 - 2021



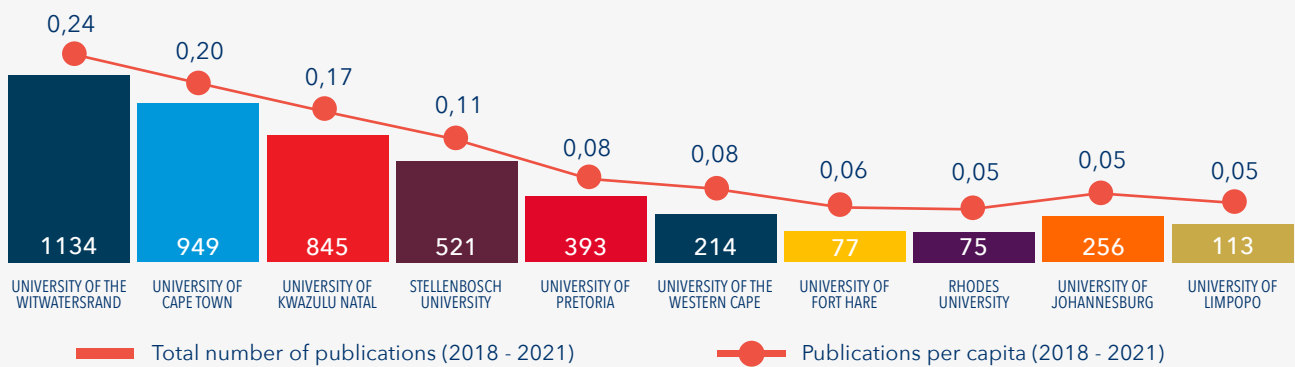
SDG 3: GOOD HEALTH & WELLBEING - Total number of publications | Publications per capita - 2018 - 2021



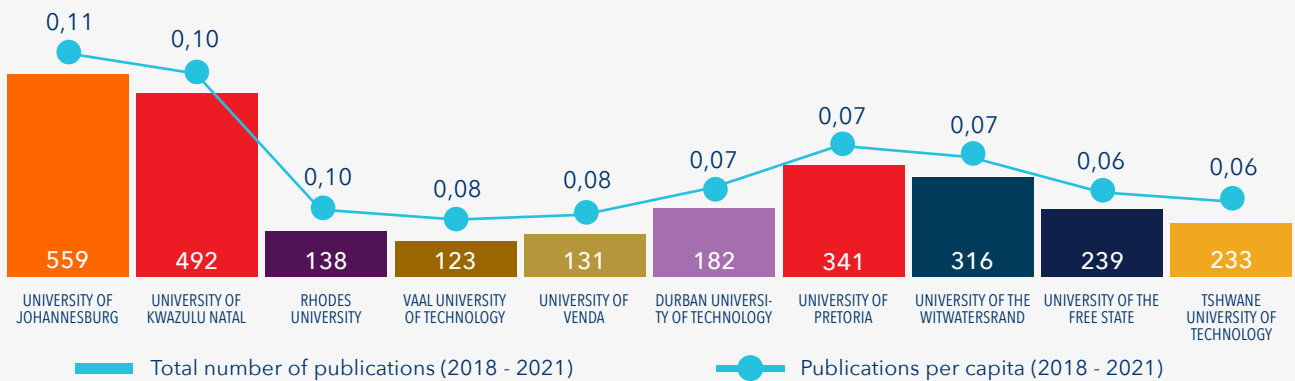
SDG 4: QUALITY EDUCATION -Total number of publications | Publications per capita - 2018 - 2021



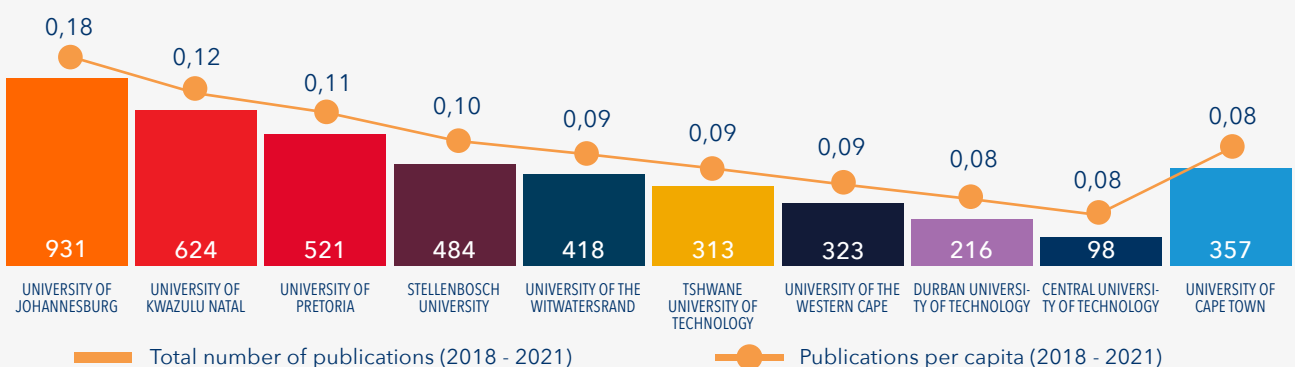
SDG 5: GENDER EQUALITY -Total number of publications | Publications per capita - 2018 - 2021



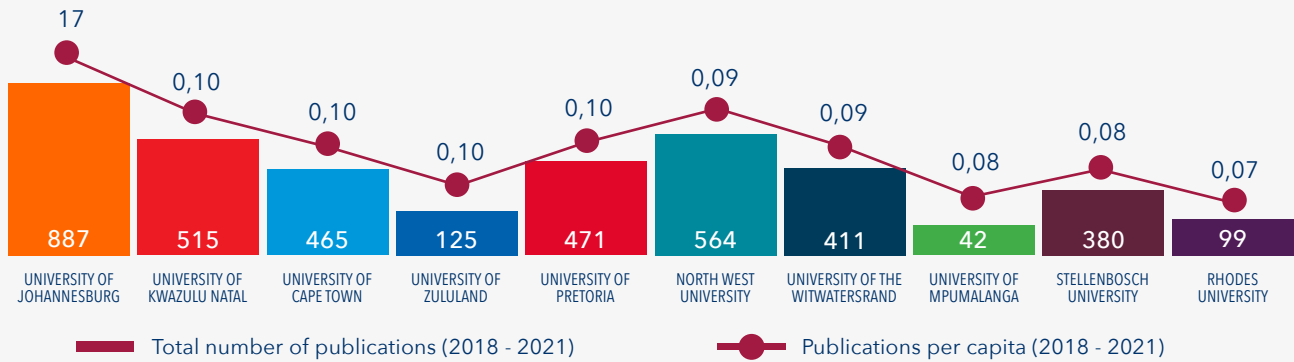
SDG 6: CLEAN WATER & SANITATION -Total number of publications | Publications per capita - 2018 - 2021



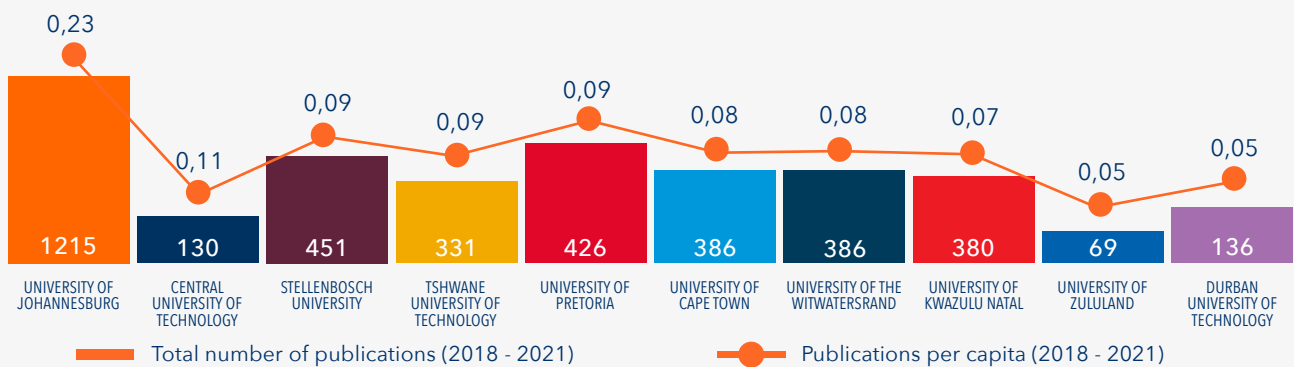
SDG 7: AFFORDABLE & CLEAN ENERGY -Total number of publications | Publications per capita - 2018 - 2021



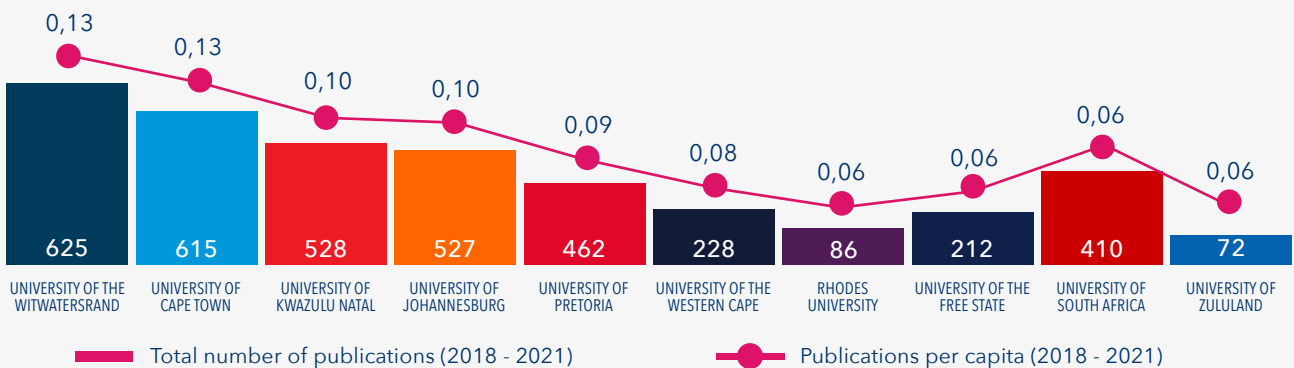
SDG 8: DECENT WORK & ECONOMIC GROWTH -Total number of publications | Publications per capita - 2018 - 2021



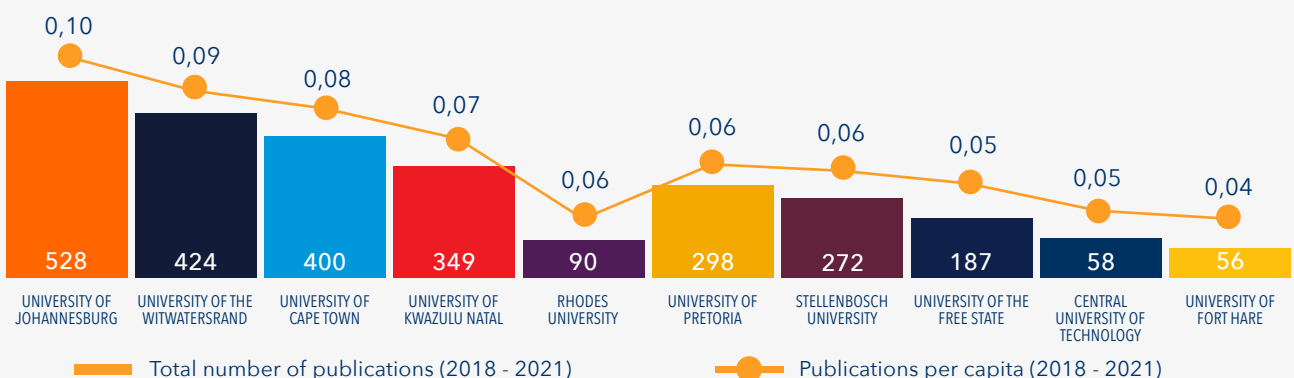
SDG 9: INDUSTRY, INNOVATION & INFRASTRUCTURE -Total number of publications | Publications per capita - 2018 - 2021



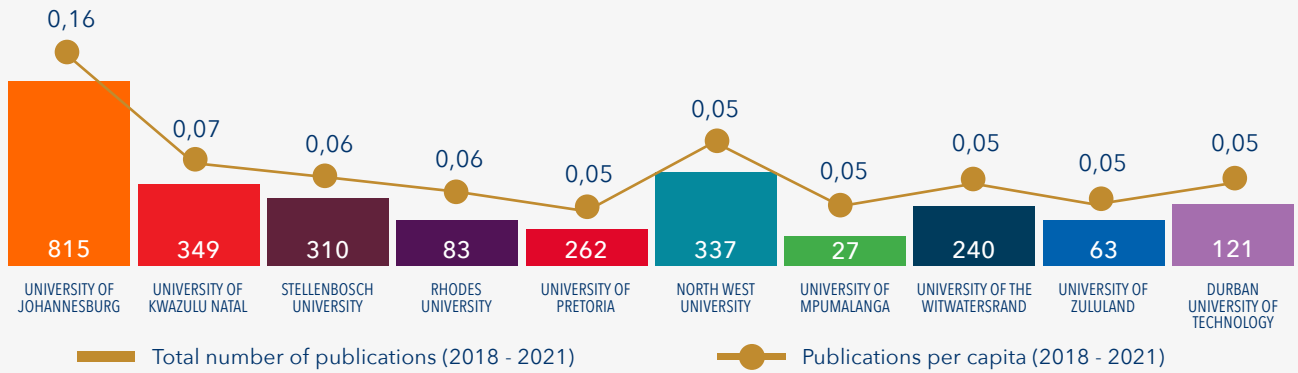
SDG 10: REDUCED INEQUALITIES -Total number of publications | Publications per capita - 2018 - 2021



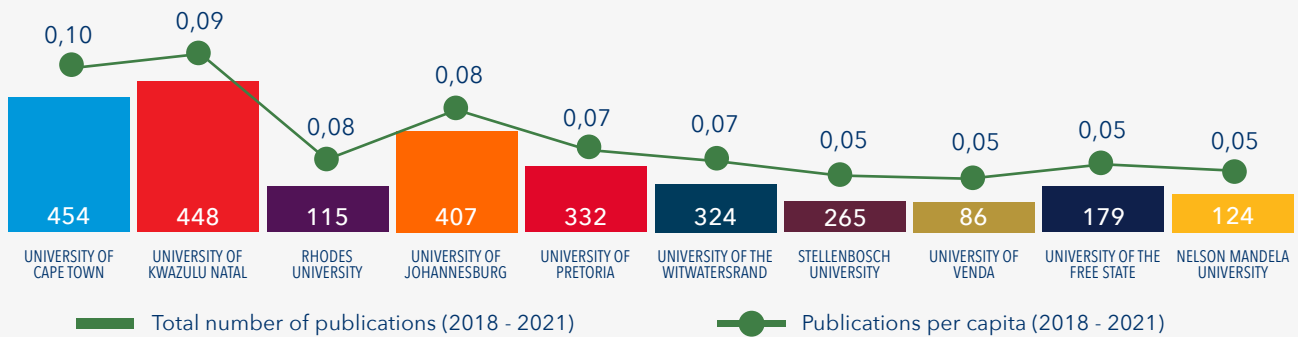
SDG 11: SUSTAINABLE CITIES & COMMUNITIES -Total number of publications | Publications per capita - 2018 - 2021



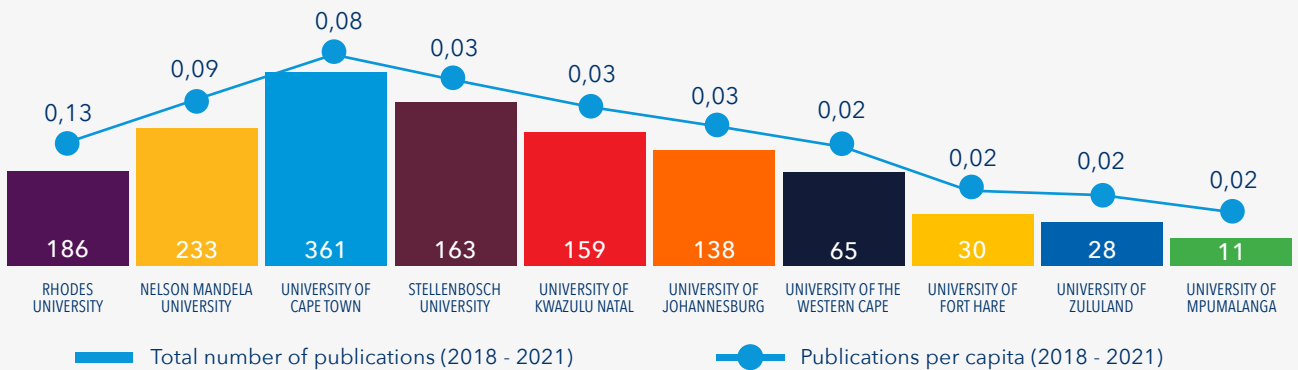
SDG 12: RESPONSIBLE CONSUMPTION & PRODUCTION -Total number of publications | Publications per capita - 2018 - 2021



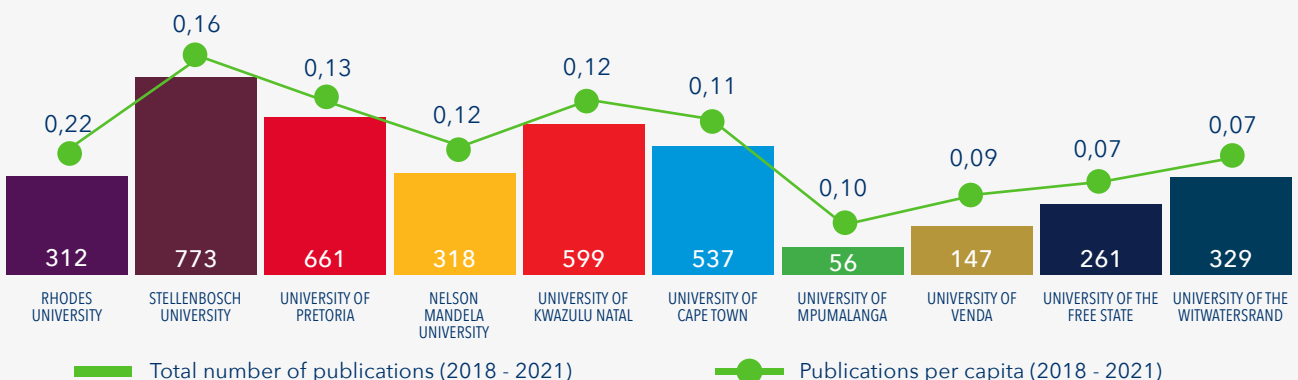
SDG 13: CLIMATE ACTION -Total number of publications | Publications per capita - 2018 - 2021



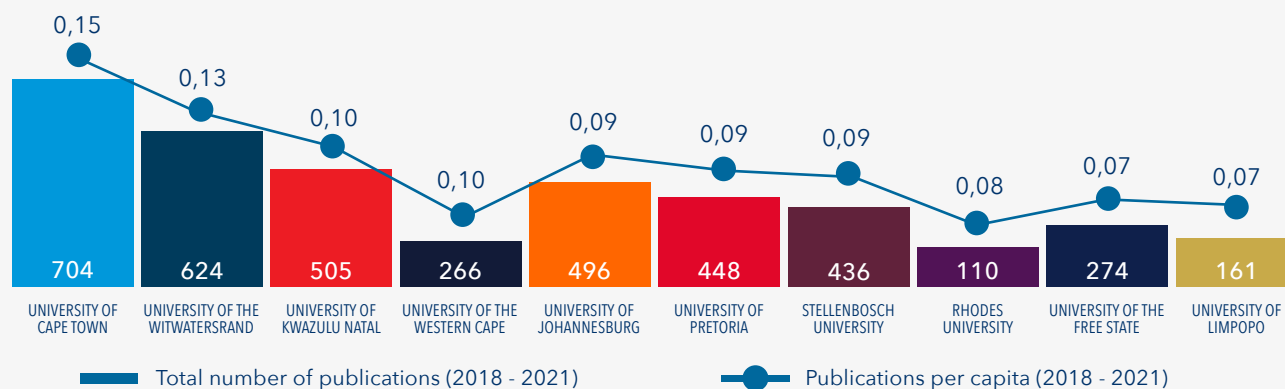
SDG 14: LIFE BELOW WATER -Total number of publications | Publications per capita - 2018 - 2021



SDG 15: LIFE ON LAND - Total number of publications | Publications per capita - 2018 - 2021



SDG 16 PEACE, JUSTICE & STRONG INSTITUTION - Total number of publications | Publications per capita - 2018 - 2021



According to the National Research Foundation (NRF), 186 SARCHI chairs²⁰ and 15 Centres of Excellence²¹ are hosted at public South African Universities. These can all significantly contribute to the research addressing the 17 SDGs. Table 2 shows the ten South African universities with the most SARCHI chairs. Compared to the above-mentioned publications data, these ten universities are also the top ten contributors to the SDGs through total research outputs. The University of Pretoria is one of the top contributors to 15 of the first 16 SDGs. The University of Cape Town, Stellenbosch University, the University of Johannesburg, and the University of the Witwatersrand are all among the top contributors to 14 of the first 16 SDGs. Noticeably, as the number of SARCHI Chairs per institution declines, their contributions to the SDGs also decline.

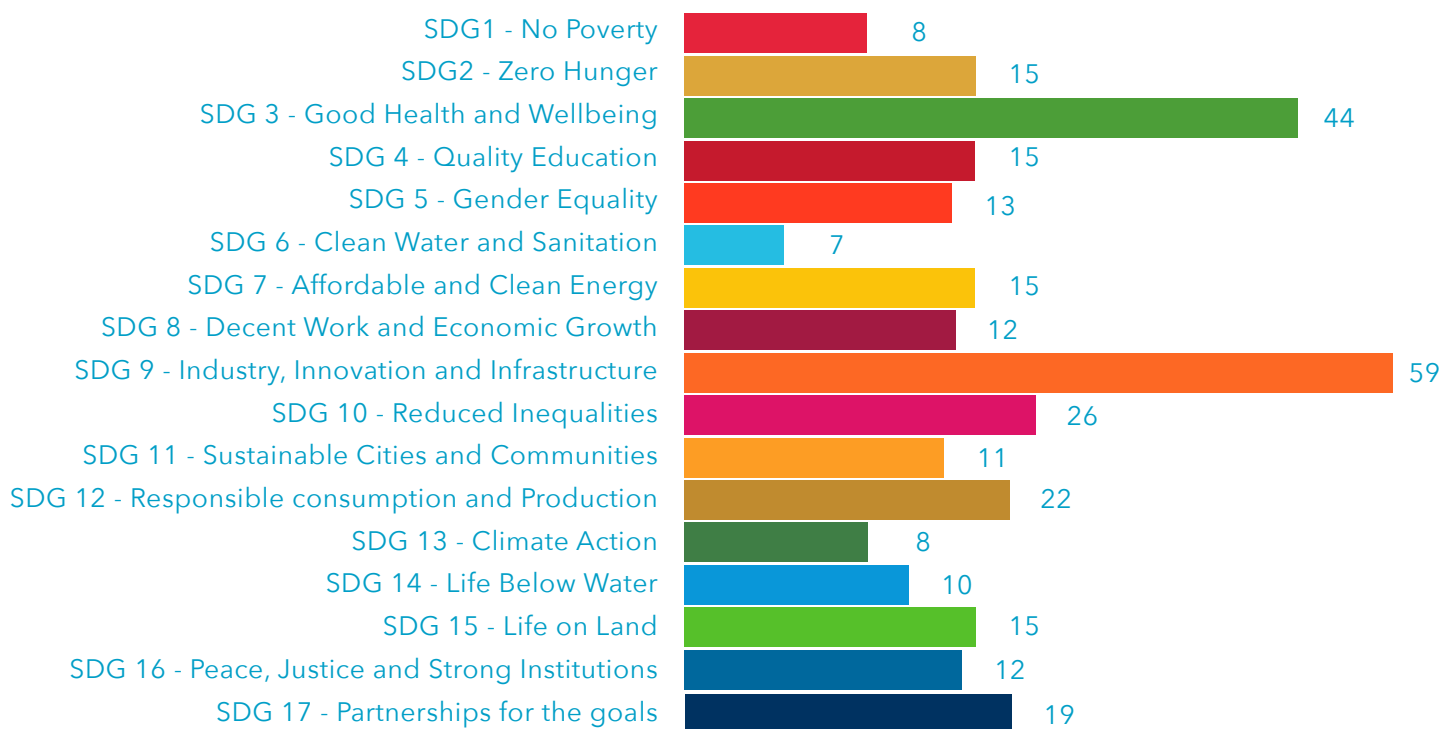
TABLE 2

Number of SARCHI Chairs per institution.

	Number of SARCHI Chairs per institution	% (n=188)
University of Cape Town	22	12%
Stellenbosch University	22	12%
University of the Witwatersrand	20	11%
University of Pretoria	19	10%
University of Johannesburg	18	10%
University of the Western Cape	17	9%
Rhodes University	11	6%
University of KwaZulu-Natal	10	5%
Tshwane University of Technology	8	4%
Nelson Mandela University	8	4%

Figure 2 indicates the way in which the SARChI Chairs are addressing the SDGs. It is clearly evident that there is a focus on SDG 3 Good Health and Wellbeing and SDG 9 Industry, Innovation and Infrastructure, explaining the strengths of research outputs in these areas. SDG 1 No Poverty, SDG 6 Clean Water and Sanitation, and SDG 13 Climate Action are the least addressed SDGs by the SARChI Chairs. SDG 1 No Poverty is the second least addressed SDG regarding publications made by universities and SDG 13 Climate Action is the third least addressed SDG.

Figure 2 - Sustainable Development Goals addressed by SARChI Chairs.



List of DSI-NRF Centres of Excellence and the addressed SDGs. Table 3 shows a very similar trend with numerous Centres of Excellence positioned in South African universities focusing on SDG 3 Good Health and Wellbeing and SDG 9 Industry, Innovation and Infrastructure, again reiterating the strengths of research outputs in these areas. However, SDG 4 Quality Education, SDG 5 Gender Equality, SDG 6 Clean Water and Sanitation, SDG 7 Affordable and Clean Energy, SDG 10 Reduced Inequalities, SDG 11 Sustainable Cities and Communities, SDG 13 Climate Action, SDG 14 Life Below Water, SDG 16 Peace, Justice and Strong Institutions, have no direct representation in any Centres of Excellence. Three of the aforementioned SDGs are in the bottom 5 SDGs addressed by publications.

TABLE 3

List of DSI-NRF Centres of Excellence and the addressed SDGs.

NAME OF THE DSI-NRF CENTRE	HOST INSTITUTION	TOTAL NUMBER OF SUSTAINABLE DEVELOPMENT GOALS ADDRESSED BY THE CENTRE	SUSTAINABLE DEVELOPMENT GOALS ADDRESSED BY THE CENTRES
DSI-NRF Centre of Excellence for Integrated Mineral and Energy Resource Analysis (CIMERA)	University of Johannesburg	3	SDG 8 Decent Work and Economic Growth, SDG 9 Industry, Innovation and Infrastructure, SDG 12 Responsible Consumption and Production
DSI-NRF Centre of Excellence in Human Development (CoE Human)	University of the Witwatersrand	1	SDG 16 Peace, Justice and Strong Institutions
DSI-NRF Centre of Excellence in Food Security (FS)	University of the Western Cape and University of Pretoria	2	SDG 1 No Poverty, SDG 2 Zero Hunger
DSI-NRF Centre of Excellence in Scientometrics and Science, Technology and Innovation (STI) Policy (SciSTIP)	University of Stellenbosch and Tshwane University of Technology	1	SDG 9 Industry, Innovation and Infrastructure
DSI-NRF Centre of Excellence in Mathematical and Statistical Sciences (MaSS)	University of the Witwatersrand	1	SDG 9 Industry, Innovation and Infrastructure
GENUS (DSI-NRF Centre of Excellence in Palaeosciences)	University of the Witwatersrand	3	SDG 9 Industry, Innovation and Infrastructure, SDG 12 Responsible Consumption and Production, SDG 15 Life on Land
The National Institute for Theoretical Physics (NITheCS)	Stellenbosch University, University of the Witwatersrand and University of KwaZulu-Natal	2	SDG 9 Industry, Innovation and Infrastructure, SDG 12 Responsible Consumption and Production
DSI-NRF Centre of Excellence in Epidemiological Modelling and Analysis (SACEMA)	University of Stellenbosch	1	SDG 3 Good Health and Wellbeing
DSI-NRF Centre of Excellence in HIV Prevention (CAPRISA)	University of KwaZulu Natal	3	SDG 3 Good Health and Wellbeing
DSI-NRF Centre of Excellence in Plant Health Biotechnology (CPHB)	University of Pretoria	2	SDG 2 Zero Hunger, SDG 15 Life on Land
DSI-NRF Centre of Excellence for Biomedical Tuberculosis Research (CBTBR)	University of Cape Town, University of Stellenbosch and University of the Witwatersrand	2	SDG 3 Good Health and Wellbeing, SDG 9 Industry, Innovation and Infrastructure
DSI-NRF Centre of Excellence in Catalysis (C*change)	University of Cape Town	1	SDG 9 Industry, Innovation and Infrastructure
DSI-NRF Centre of Excellence Birds as Keys to Biodiversity Conservation	University of Cape Town	1	SDG 15 Life on Land
DSI-NRF Centre of Excellence in Strong Material (SM)	University of the Witwatersrand	1	SDG 9 Industry, Innovation and Infrastructure
DSI-NRF Centre of Excellence for Invasion Biology (CIB)	University of Stellenbosch	4	SDG 2 Zero Hunger, SDG 8 Decent Work and Economic Growth, SDG 12 Responsible Consumption and Production, SDG 15 Life on Land

PUBLICATION IMPACT

Publishing in high-impact journals is a reflection of the quality of the research and is important for the impact of the findings and its influence in the field. Table 4 indicates the five South African Universities with the most journal publications published in the world's top 25% journals per SDG.

For ten of the SDGs, the top five contributors had, on average, more than half (50%) of their publications published in the world's top 25% of journals. More than two-thirds (70%) of the publications by the five universities mentioned for SDG 13 Climate Action were published in the top 25% of journals worldwide. Some other SDGs that stood out regarding impact through publications were SDG 14 Life Below Water and SDG 15 Life on Land, which had more than 60% of the publications, on average, published in the top 25% of journals worldwide.

TABLE 4

Publications in the top 25% Journal Percentiles by CiteScore Percentile.

INSTITUTION	SCHOLARLY OUTPUT	PUBLICATIONS IN TOP 25% JOURNAL PERCENTILES BY CITESCORE PERCENTILE	%
SDG 1 - NO POVERTY			
University of Cape Town	559	285	51%
University of the Witwatersrand	462	211	46%
Stellenbosch University	359	151	42%
University of Pretoria	398	167	42%
University of the Western Cape	204	82	40%
SDG 2 - ZERO HUNGER			
University of Cape Town	575	365	63%
University of the Witwatersrand	572	355	62%
Stellenbosch University	803	428	53%
University of Pretoria	820	433	53%
Rhodes University	300	156	52%
SDG 3 - GOOD HEALTH AND WELLBEING			
University of Cape Town	7955	5007	63%
University of the Witwatersrand	7587	4317	57%
Stellenbosch University	5186	2858	55%
Rhodes University	511	258	50%
North-West University	1724	870	50%
University of Pretoria	3617	1816	50%
SDG 4 - QUALITY EDUCATION			
University of Cape Town	595	242	41%
Stellenbosch University	527	192	36%
University of the Witwatersrand	542	196	36%
North-West University	600	189	32%
University of KwaZulu-Natal	571	157	27%
Rhodes University	159	43	27%
University of Pretoria	581	157	27%

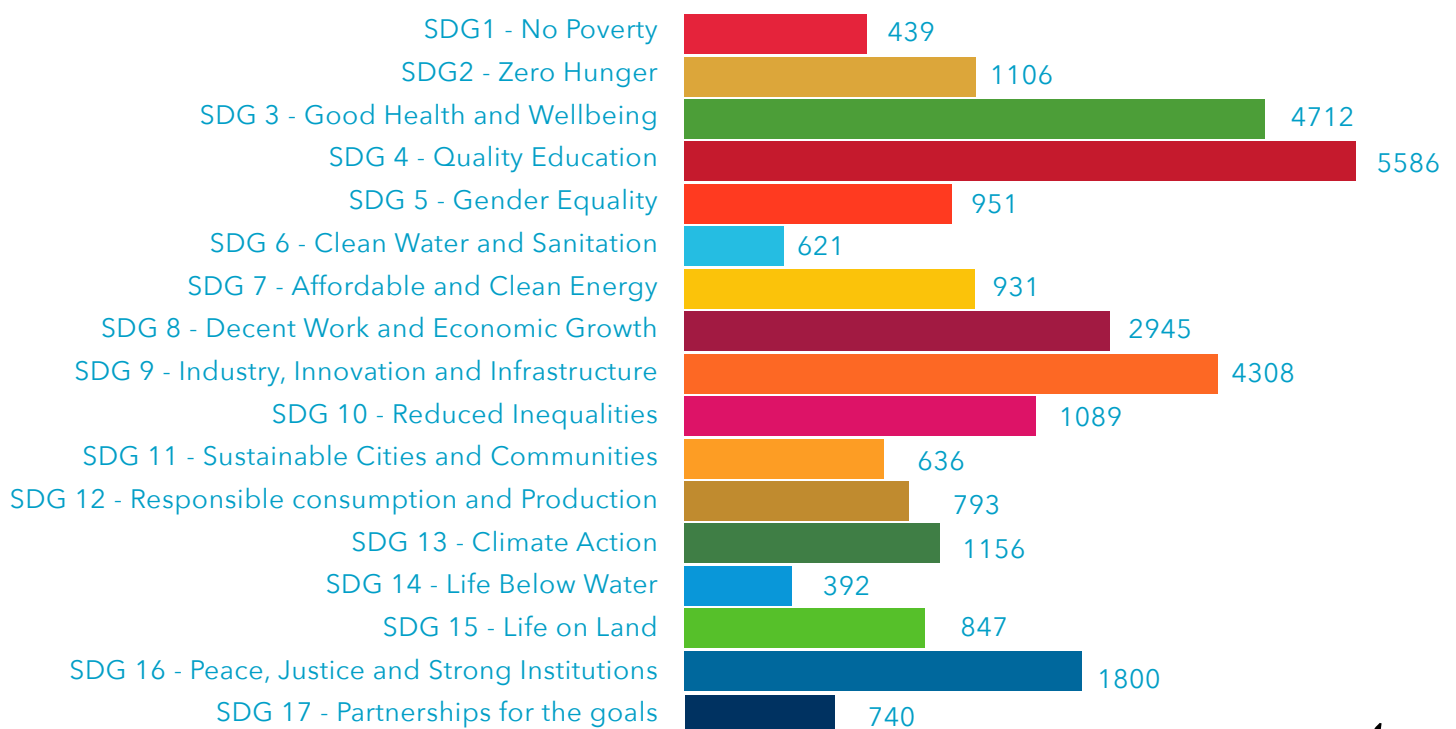
INSTITUTION	SCHOLARLY OUTPUT	PUBLICATIONS IN TOP 25% JOURNAL PERCENTILES BY CITESCORE PERCENTILE	%
SDG 5 - GENDER EQUALITY			
University of Cape Town	1467	931	63%
University of the Witwatersrand	1735	1062	61%
Stellenbosch University	823	483	59%
University of KwaZulu-Natal	1306	663	51%
Walter Sisulu University	97	45	46%
University of Pretoria	617	284	46%
SDG 6 - CLEAN WATER AND SANITATION			
University of Cape Town	391	232	59%
University of South Africa	732	384	52%
University of Fort Hare	150	78	52%
University of the Witwatersrand	531	271	51%
University of Mpumalanga	67	34	51%
SDG 7 - AFFORDABLE AND CLEAN ENERGY			
University of the Western Cape	365	228	62%
Rhodes University	92	53	58%
University of Pretoria	884	508	57%
University of Cape Town	570	295	52%
University of the Witwatersrand	689	342	50%
SDG 8 - DECENT WORK AND ECONOMIC GROWTH			
University of Cape Town	711	358	50%
Stellenbosch University	617	294	48%
University of the Witwatersrand	684	300	44%
University of Pretoria	779	337	43%
Nelson Mandela University	240	97	40%
Rhodes University	175	70	40%
SDG 9 - INDUSTRY, INNOVATION AND INFRASTRUCTURE			
Sefako Makgatho Health Sciences University	14	7	50%
Rhodes University	105	46	44%
University of the Witwatersrand	658	288	44%
University of The Free State	249	108	43%
University of Cape Town	633	262	41%
SDG10 - REDUCED INEQUALITIES			
University of Cape Town	1013	533	53%
Sefako Makgatho Health Sciences University	49	25	51%
University of the Witwatersrand	1028	513	50%
Stellenbosch University	783	342	44%
University of Pretoria	744	317	43%

INSTITUTION	SCHOLARLY OUTPUT	PUBLICATIONS IN TOP 25% JOURNAL PERCENTILES BY CITESCORE PERCENTILE	%
SDG 11 - SUSTAINABLE CITIES AND COMMUNITIES			
University of Cape Town	640	373	58%
Rhodes University	152	83	55%
University of the Western Cape	162	88	54%
Stellenbosch University	433	229	53%
University of the Witwatersrand	665	343	52%
SDG 12 - RESPONSIBLE CONSUMPTION AND PRODUCTION			
Stellenbosch University	533	299	56%
University of Cape Town	383	201	52%
University of the Witwatersrand	444	228	51%
University of The Free State	275	130	47%
Nelson Mandela University	177	83	47%
Rhodes University	143	67	47%
University of Pretoria	481	224	47%
SDG 13 - CLIMATE ACTION			
Sefako Makgatho Health Sciences University	7	6	86%
University of Cape Town	740	528	71%
Rhodes University	180	120	67%
Nelson Mandela University	221	142	64%
University of Pretoria	650	388	60%
SDG 14 - LIFE BELOW WATER			
University of Cape Town	536	404	75%
Nelson Mandela University	383	262	68%
University of Pretoria	151	95	63%
Rhodes University	287	178	62%
Durban University of Technology	39	24	62%
SDG 15 - LIFE ON LAND			
Stellenbosch University	1143	778	68%
University of Cape Town	810	517	64%
University of the Witwatersrand	527	323	61%
Nelson Mandela University	516	314	61%
University of Pretoria	1027	593	58%
SDG 16 - PEACE, JUSTICE AND STRONG INSTITUTION			
University of Cape Town	1053	563	53%
University of the Witwatersrand	976	493	51%
Stellenbosch University	749	349	47%
North-West University	578	214	37%
University of Pretoria	744	269	36%

UNIVERSITY ANNUAL AND RESEARCH REPORTS

Annual and research reports by Universities are written and published to showcase their growth, contributions, activities, events, achievements, and strategic focus. As part of this study, the researchers used the European Commission's SDG mapping tool that identifies relevant SDGs in the text from documents uploaded. Annual research and innovation reports were used where available, and where these were unavailable, University Annual Reports were used. As expected, these reports showcase the academic contributions made by universities, including workshops, seminars, and school outreaches, making SDG 4 Quality Education the top addressed SDG in these reports with a significant 5 586 contributions listed. Reinforcing data from publications and focus areas of the Centres of Excellence, SDG 3 Good Health and Wellbeing followed with 4 712 contributions and SDG 9 Industry, Innovation and Infrastructure with 4 308 contributions. As was the case with the total research outputs, SDG 1 No Poverty (439 contributions) and SDG 14 Life Below Water (392 contributions) were the two SDGs that were the least contributed to by South African Universities (Figure 3).

Figure 3 - Total contributions to the SDGs as presented in annual and research reports by South African Universities.



As seen in the data for contributions made through total research outputs, Rhodes University is one of the strongest contributors to the attainment of the SDGs, as presented in its annual and research reports, being the top contributor in 6 of the SDGs (Table 5).

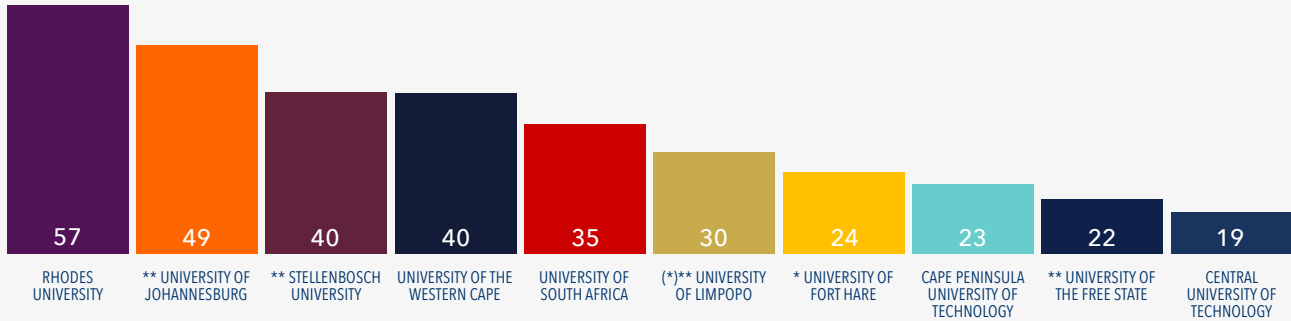
The University of Johannesburg is again one of the top-performing universities in terms of contribution to the SDGs. The Cape Peninsula University of Technology has made significant contributions to the SDGs as showcased in its annual and research reports, being the top contributor to three SDGs (SDG 4 Quality Education, SDG 7 Affordable and Clean Energy, SDG 17 Partnerships for the Goals) and in the top ten for 13 other SDGs.



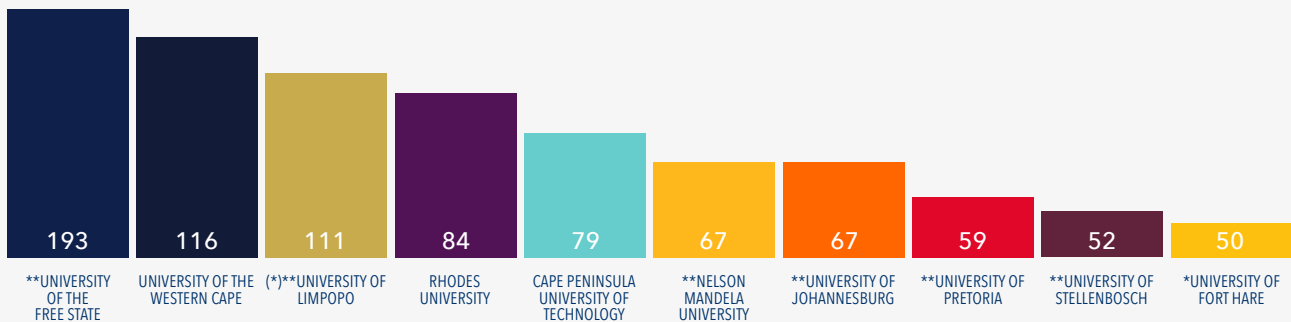
TABLE 5

Sustainable Development Goals addressed and presented in South African Universities' annual and research reports.

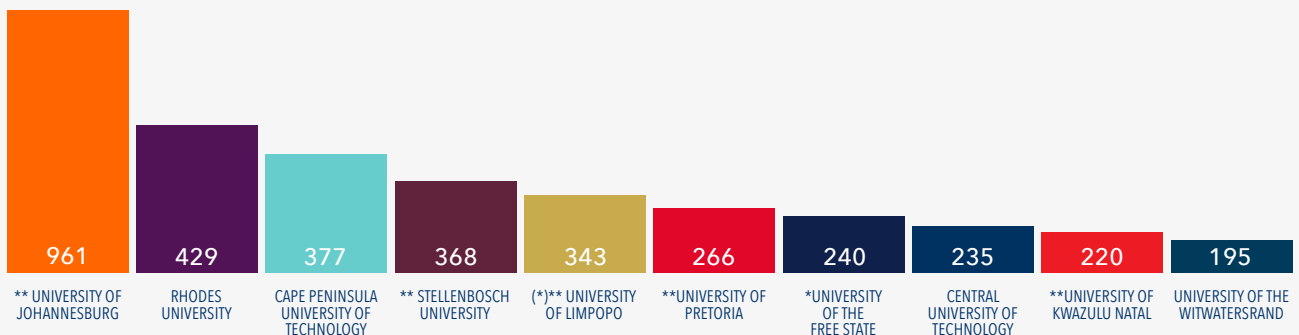
SDG 1 - NO POVERTY



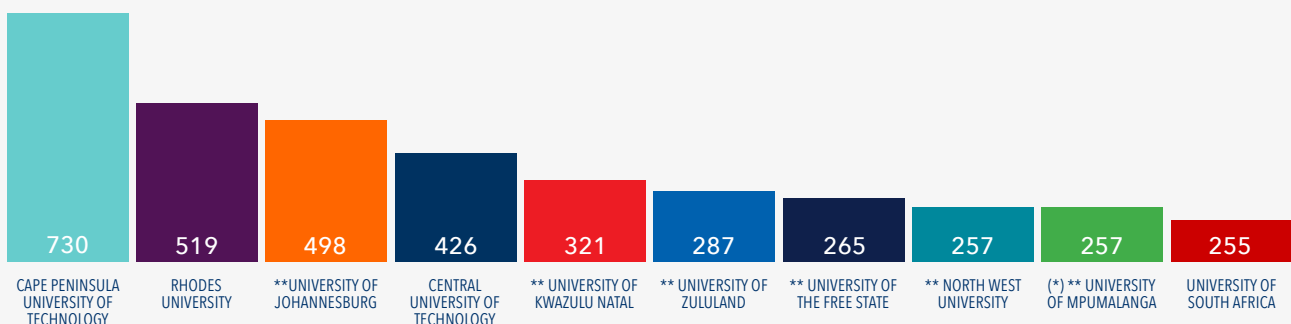
SDG 2 - ZERO HUNGER



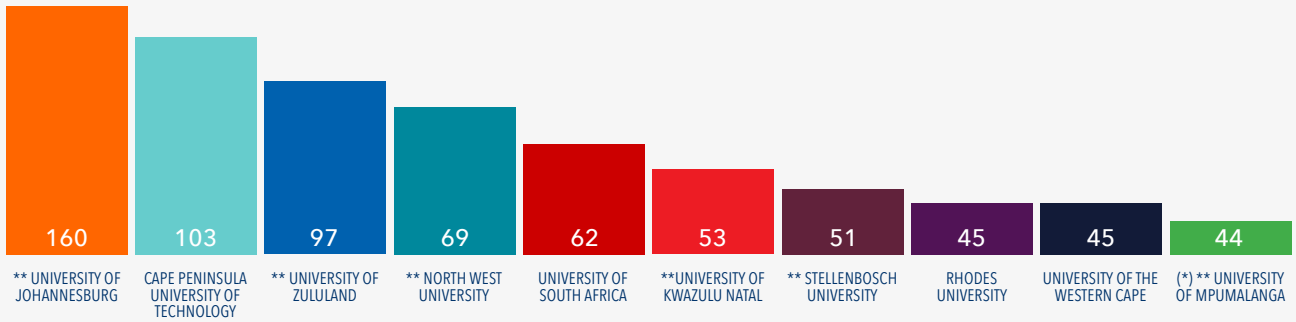
SDG 3 - GOOD HEALTH AND WELLBEING



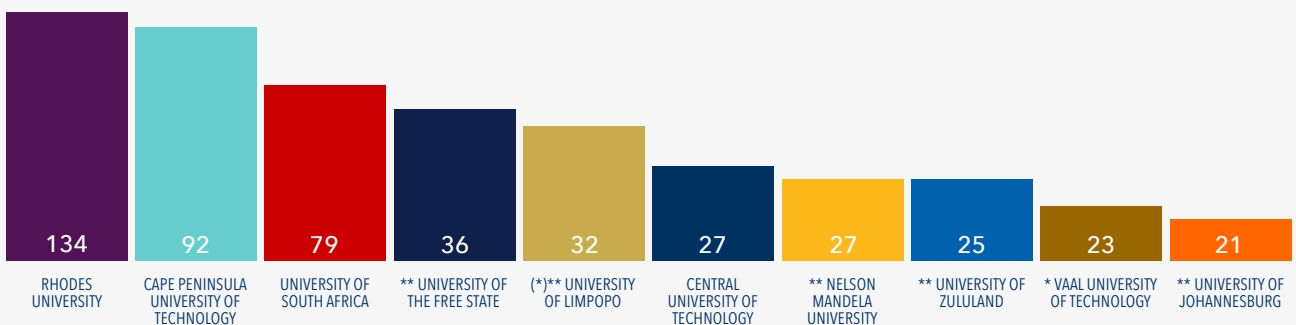
SDG 4 - QUALITY EDUCATION



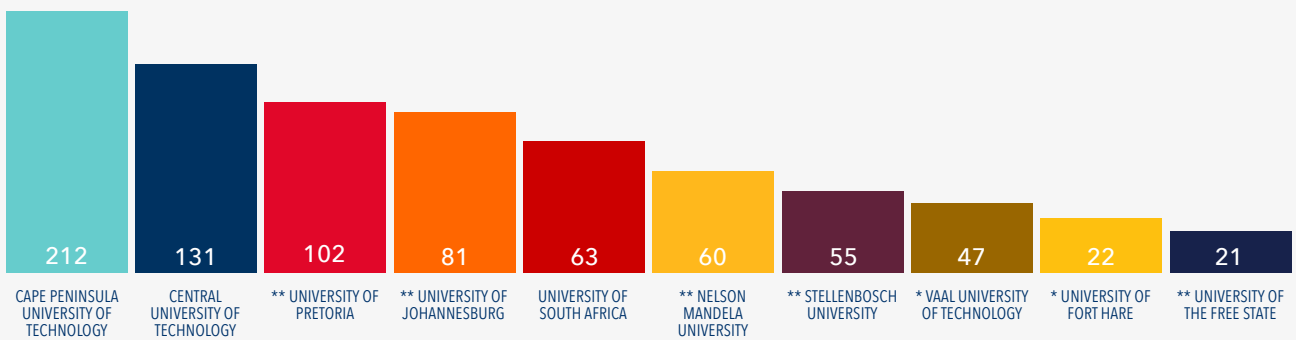
SDG 5 - GENDER EQUALITY



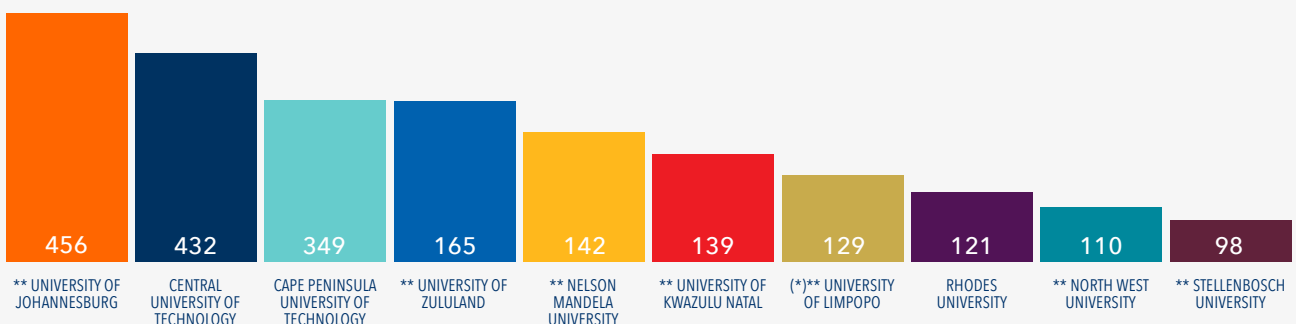
SDG 6 - CLEAN WATER AND SANITATION



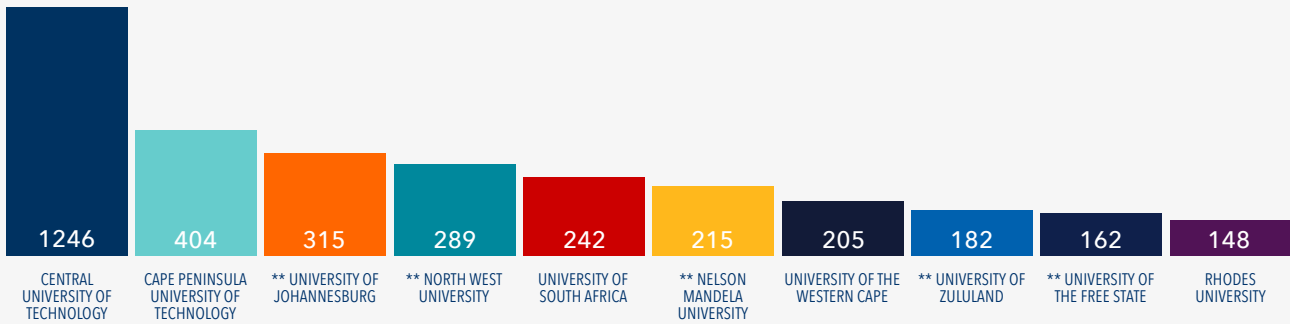
SDG 7 - AFFORDABLE AND CLEAN ENERGY



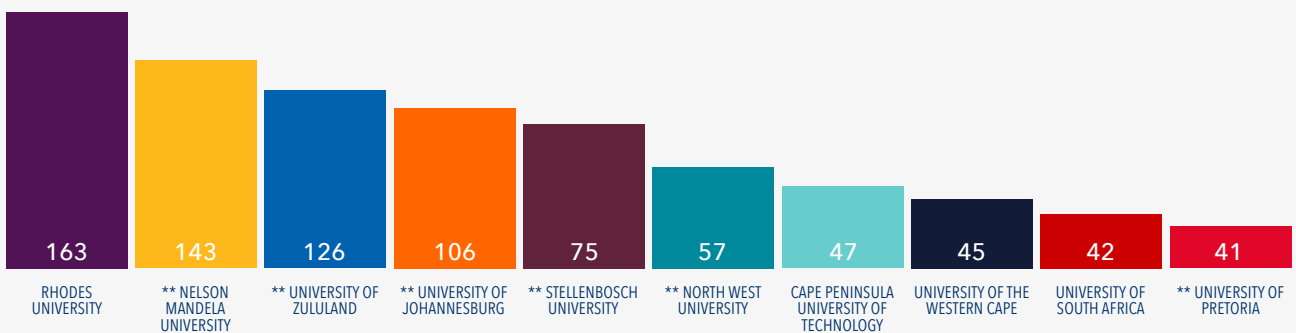
SDG 8 - DECENT WORK AND ECONOMIC GROWTH



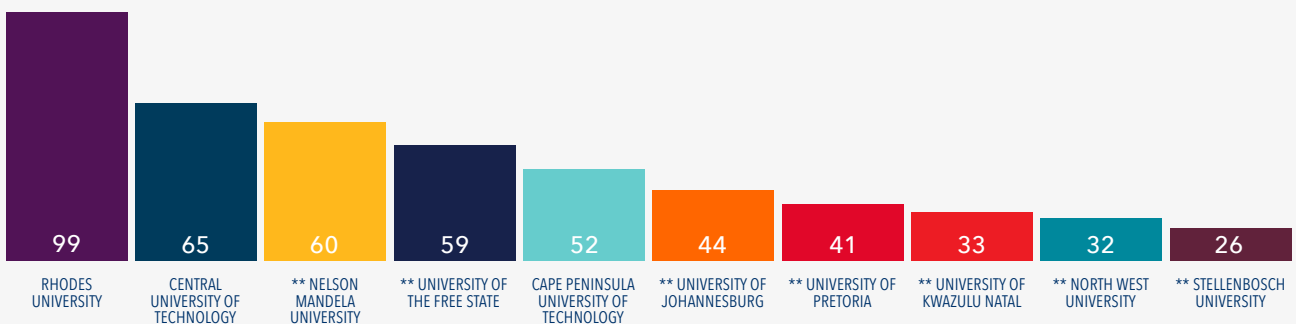
SDG 9 - INDUSTRY, INNOVATION AND INFRASTRUCTURE



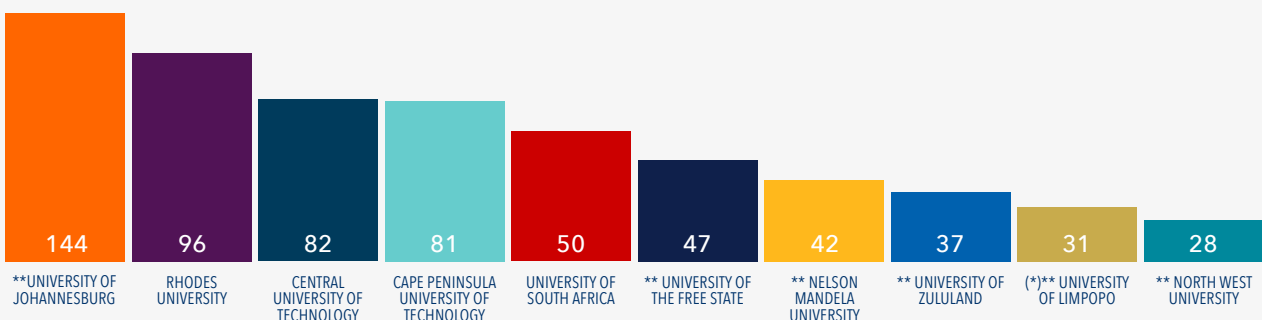
SDG 10 - REDUCED INEQUALITIES



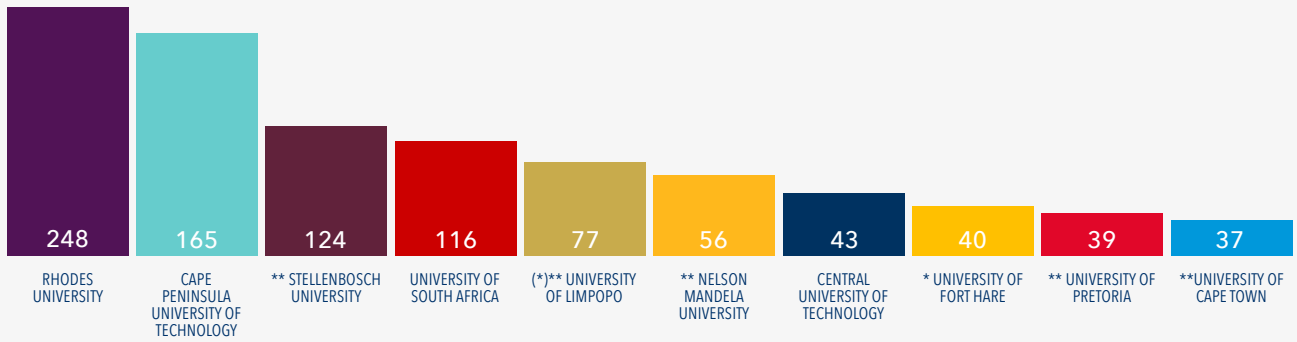
SDG 11 - SUSTAINABLE CITIES AND COMMUNITIES



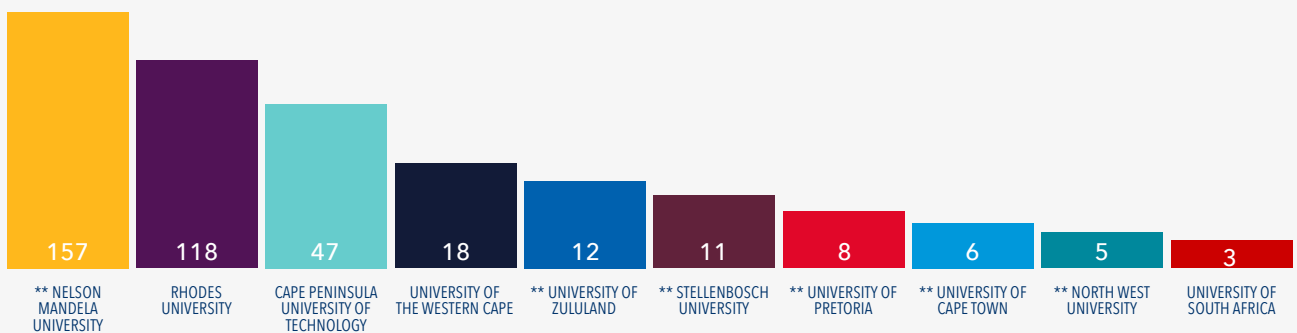
SDG 12 - RESPONSIBLE CONSUMPTION AND PRODUCTION



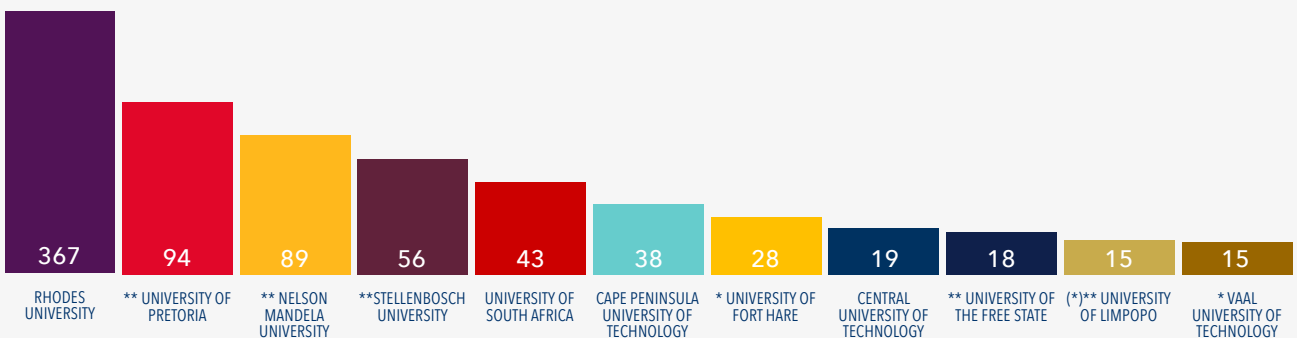
SDG 13 - CLIMATE ACTION



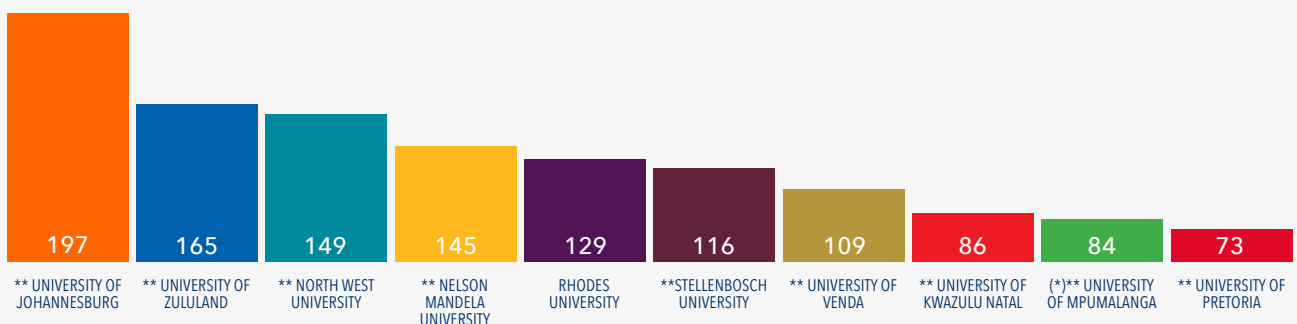
SDG 14 - LIFE BELOW WATER



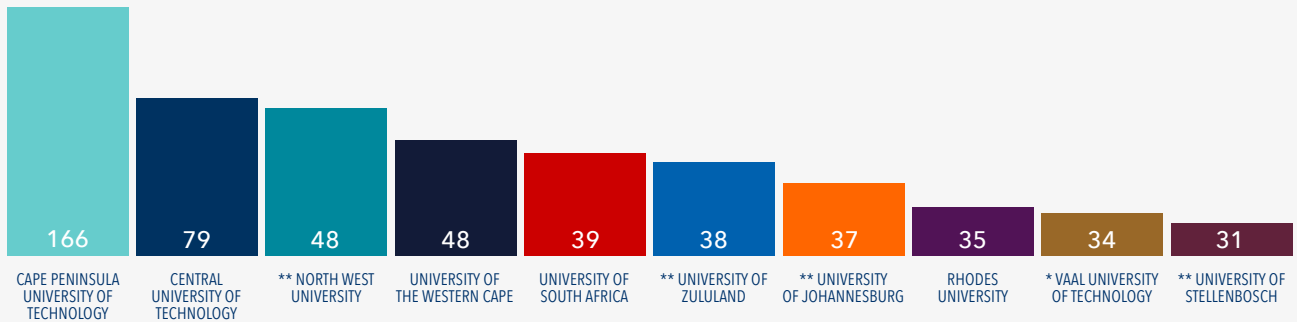
SDG 15 - LIFE ON LAND



SDG 16 - PEACE, JUSTICE AND STRONG INSTITUTIONS



SDG 17 - PARTNERSHIPS FOR THE GOALS



* Data incomplete

** Used annual reports for years where there were no research reports

COLLABORATIONS

The data collected from SciVal, presented in Table 6, indicates the overall geographical collaborations at the South African Universities. Additionally, it indicates the top ten collaborators at each University in South Africa based on the number of co-authored publications. Although the vast majority of collaborations at South African Universities are international, most co-author publications at South African Universities are produced from national collaborations. This is an excellent trend and a positive indication of the level of national collaborations already in place, which can be strengthened to address the SDG challenges.

TABLE 6

Geographical collaborations with top ten collaborators regarding co-author publications.

OVERALL GEOGRAPHICAL COLLABORATION	TOP TEN INSTITUTIONS COLLABORATING WITH THE UNIVERSITY	SECTOR	COUNTRY
<p>CAPE PENINSULA UNIVERSITY OF TECHNOLOGY</p> <p>34% International Collaboration</p> <p>27% Only national Collaboration</p> <p>30% Only institutional collaboration</p> <p>9% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. Stellenbosch University 2. University of Cape Town 3. University of the Western Cape 4. University of Johannesburg 5. Tshwane University of Technology 6. University of South Africa 7. University of KwaZulu-Natal 8. North-West University 9. Paris-Est Sup 10. Université Paris-Est Créteil 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. France 10. France
<p>CENTRAL UNIVERSITY OF TECHNOLOGY</p> <p>24% International Collaboration</p> <p>31% Only national Collaboration</p> <p>31% Only institutional collaboration</p> <p>14% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of The Free State 2. University of KwaZulu-Natal 3. Nelson Mandela University 4. Stellenbosch University 5. Council for Scientific and Industrial Research 6. Mangosuthu University of Technology 7. Tshwane University of Technology 8. University of South Africa 9. University of Johannesburg 10. North-West University 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Government 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. South Africa

OVERALL GEOGRAPHICAL COLLABORATION	TOP TEN INSTITUTIONS COLLABORATING WITH THE UNIVERSITY	SECTOR	COUNTRY
<p>MANGOSUTHU UNIVERSITY OF TECHNOLOGY</p> <p>28% International Collaboration</p> <p>46% Only national Collaboration</p> <p>11% Only institutional collaboration</p> <p>15% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of KwaZulu-Natal 2. Durban University of Technology 3. Central University of Technology 4. University of Johannesburg 5. University of Zululand 6. University of the Witwatersrand 7. Babcock University 8. Lovely Professional University 9. North-West University 10. Osun State University 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. Nigeria 8. India 9. South Africa 10. Nigeria
<p>NELSON MANDELA UNIVERSITY</p> <p>45% International Collaboration</p> <p>22% Only national Collaboration</p> <p>21% Only institutional collaboration</p> <p>12% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Cape Town 2. University of KwaZulu-Natal 3. CNRS 4. Rhodes University 5. University of Pretoria 6. Stellenbosch University 7. University of the Witwatersrand 8. University of Johannesburg 9. University of The Free State 10. Institut de recherche pour le développement 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Government 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Government 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. France 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. France
<p>NORTH WEST UNIVERSITY</p> <p>52% International Collaboration</p> <p>16% Only national Collaboration</p> <p>20% Only institutional collaboration</p> <p>12% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Johannesburg 2. University of the Witwatersrand 3. University of Pretoria 4. University of KwaZulu-Natal 5. CNRS 6. University of The Free State 7. Stellenbosch University 8. University of Cape Town 9. University of South Africa 10. South African Medical Research Council 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Government 6. Academic 7. Academic 8. Academic 9. Academic 10. Government 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. France 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. South Africa
<p>RHODES UNIVERSITY</p> <p>52% International Collaboration</p> <p>17% Only national Collaboration</p> <p>18% Only institutional collaboration</p> <p>14% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Cape Town 2. CNRS 3. National Research Foundation 4. National Institute for Astrophysics 5. University of KwaZulu-Natal 6. University of Pretoria 7. Nelson Mandela University 8. University of the Western Cape 9. University of the Witwatersrand 10. Stellenbosch University 	<ol style="list-style-type: none"> 1. Academic 2. Government 3. Government 4. Government 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. France 3. South Africa 4. Italy 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. South Africa
<p>SEFAKO MAKGATHO HEALTH SCIENCES UNIVERSITY</p> <p>53% International Collaboration</p> <p>27% Only national Collaboration</p> <p>17% Only institutional collaboration</p> <p>4% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of the Witwatersrand 2. University of Pretoria 3. King Abdulaziz University 4. University of KwaZulu-Natal 5. University of Strathclyde 6. University of The Free State 7. University of Cape Town 8. South African Medical Research Council 9. Near East University 10. University of South Africa 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Government 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. Saudi Arabia 4. South Africa 5. United Kingdom 6. South Africa 7. South Africa 8. South Africa 9. Turkey 10. South Africa

OVERALL GEOGRAPHICAL COLLABORATION	TOP TEN INSTITUTIONS COLLABORATING WITH THE UNIVERSITY	SECTOR	COUNTRY
<p>STELLENBOSCH UNIVERSITY</p> <p>52% International Collaboration</p> <p>19% Only national Collaboration</p> <p>18% Only institutional collaboration</p> <p>11% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Cape Town 2. South African Medical Research Council 3. University of the Witwatersrand 4. University of Pretoria 5. University of KwaZulu-Natal 6. Harvard University 7. National Health Laboratory Services 8. University of the Western Cape 9. University College London 10. London School of Hygiene and 	<ol style="list-style-type: none"> 1. Academic 2. Government 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. United States 7. South Africa 8. South Africa 9. United Kingdom 10. United Kingdom
<p>TSHWANE UNIVERSITY OF TECHNOLOGY</p> <p>49% International Collaboration</p> <p>24% Only national Collaboration</p> <p>22% Only institutional collaboration</p> <p>5% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Johannesburg 2. Covenant University 3. Council for Scientific and Industrial Research 4. University of South Africa 5. Texas A&M University 6. Texas A&M University at Qatar 7. University of Pretoria 8. Wuhan Donghu University 9. King Abdulaziz University 10. Bozok University 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Government 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. Nigeria 3. South Africa 4. South Africa 5. United States 6. Qatar 7. South Africa 8. China 9. Saudi Arabia 10. Turkey
<p>UNIVERSITY OF CAPE TOWN</p> <p>65% International Collaboration</p> <p>14% Only national Collaboration</p> <p>12% Only institutional collaboration</p> <p>9% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. Stellenbosch University 2. University of the Witwatersrand 3. South African Medical Research Council 4. CNRS 5. University of Oxford 6. Harvard University 7. University College London 8. University of Washington 9. University of KwaZulu-Natal 10. Université Paris Cité 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Government 4. Government 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. France 5. United Kingdom 6. United States 7. United Kingdom 8. United States 9. South Africa 10. France
<p>UNIVERSITY OF FORT HARE</p> <p>30% International Collaboration</p> <p>25% Only national Collaboration</p> <p>31% Only institutional collaboration</p> <p>14% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of The Free State 2. University of KwaZulu-Natal 3. Walter Sisulu University 4. Stellenbosch University 5. University of Pretoria 6. North-West University 7. University of the Witwatersrand 8. University of Limpopo 9. University of Johannesburg 10. University of South Africa 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. South Africa
<p>UNIVERSITY OF JOHANNESBURG</p> <p>51% International Collaboration</p> <p>13% Only national Collaboration</p> <p>23% Only institutional collaboration</p> <p>13% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of the Witwatersrand 2. CNRS 3. University of Cape Town 4. Council for Scientific and Industrial Research 5. University of Oxford 6. CSIC 7. National Institute for Nuclear Physics 8. University of Amsterdam 9. Harvard University 10. University of South Africa 	<ol style="list-style-type: none"> 1. Academic 2. Government 3. Academic 4. Government 5. Academic 6. Academic 7. Government 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. France 3. South Africa 4. South Africa 5. United Kingdom 6. Spain 7. Italy 8. Netherlands 9. United States 10. South Africa

OVERALL GEOGRAPHICAL COLLABORATION	TOP TEN INSTITUTIONS COLLABORATING WITH THE UNIVERSITY	SECTOR	COUNTRY
<p>UNIVERSITY OF KWAZULU-NATAL</p> <p>50% International Collaboration</p> <p>19% Only national Collaboration</p> <p>24% Only institutional collaboration</p> <p>8% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of the Witwatersrand 2. University of Cape Town 3. South African Medical Research Council 4. Stellenbosch University 5. University of Pretoria 6. Harvard University 7. National Health Laboratory Services 8. University College London 9. Centre for the AIDS Programme of Research in South Africa 10. University of The Free State 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Government 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. United States 7. South Africa 8. United Kingdom 9. South Africa 10. South Africa
<p>UNIVERSITY OF LIMPOPO</p> <p>36% International Collaboration</p> <p>28% Only national Collaboration</p> <p>22% Only institutional collaboration</p> <p>15% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. Mahidol University 2. University of KwaZulu-Natal 3. University of The Free State 4. University of South Africa 5. University of the Witwatersrand 6. University of Pretoria 7. Asia University Taiwan 8. Agricultural Research Council 9. Council for Scientific and Industrial Research 10. University of the Western Cape 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Government 9. Government 10. Academic 	<ol style="list-style-type: none"> 1. Thailand 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. Taiwan 8. South Africa 9. South Africa 10. South Africa
<p>UNIVERSITY OFMPUMALANGA</p> <p>31% International Collaboration</p> <p>47% Only national Collaboration</p> <p>9% Only institutional collaboration</p> <p>13% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. North-West University 2. Rhodes University 3. University of KwaZulu-Natal 4. University of Pretoria 5. University of Venda 6. National Research Foundation 7. University of Fort Hare 8. University of Johannesburg 9. University of Limpopo 10. University of Cape Town 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Government 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. South Africa
<p>UNIVERSITY OF PRETORIA</p> <p>50% International Collaboration</p> <p>19% Only national Collaboration</p> <p>19% Only institutional collaboration</p> <p>12% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of the Witwatersrand 2. University of Cape Town 3. Stellenbosch University 4. University of KwaZulu-Natal 5. South African Medical Research Council 6. Council for Scientific and Industrial Research 7. University of Johannesburg 8. National Health Laboratory Services 9. Agricultural Research Council 10. University of South Africa 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Government 6. Government 7. Academic 8. Academic 9. Government 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. South Africa
<p>UNIVERSITY OF SOUTH AFRICA</p> <p>38% International Collaboration</p> <p>19% Only national Collaboration</p> <p>18% Only institutional collaboration</p> <p>25% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Johannesburg 2. University of the Witwatersrand 3. University of Pretoria 4. National Research Foundation 5. iThemba Laboratory for Accelerator-Based Sciences 6. North-West University 7. University of KwaZulu-Natal 8. Tshwane University of Technology 9. University of Cape Town 10. Council for Scientific and Industrial Research 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Government 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Government 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. South Africa

OVERALL GEOGRAPHICAL COLLABORATION	TOP TEN INSTITUTIONS COLLABORATING WITH THE UNIVERSITY	SECTOR	COUNTRY
<p>UNIVERSITY OF THE FREE STATE</p> <p>50% International Collaboration</p> <p>17% Only national Collaboration</p> <p>15% Only institutional collaboration</p> <p>19% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of KwaZulu-Natal 2. University of the Witwatersrand 3. University of Pretoria 4. North-West University 5. University of Cape Town 6. Stellenbosch University 7. University of Johannesburg 8. Agricultural Research Council 9. CNRS 10. KU Leuven 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Government 9. Government 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. France 10. Belgium
<p>UNIVERSITY OF THE WESTERN CAPE</p> <p>53% International Collaboration</p> <p>20% Only national Collaboration</p> <p>14% Only institutional collaboration</p> <p>13% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Cape Town 2. Stellenbosch University 3. South African Medical Research Council 4. University of KwaZulu-Natal 5. University of Pretoria 6. CNRS 7. University of the Witwatersrand 8. National Institute for Astrophysics 9. University of Oxford 10. Cape Peninsula University of Technology 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Government 4. Academic 5. Academic 6. Government 7. Academic 8. Government 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. France 7. South Africa 8. Italy 9. United Kingdom 10. South Africa
<p>UNIVERSITY OF THE WITWATERSRAND</p> <p>56% International Collaboration</p> <p>18% Only national Collaboration</p> <p>13% Only institutional collaboration</p> <p>13% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Cape Town 2. South African Medical Research Council 3. National Health Laboratory Services 4. University of Johannesburg 5. CNRS 6. University of KwaZulu-Natal 7. University of Pretoria 8. Harvard University 9. University of Oxford 10. Stellenbosch University 	<ol style="list-style-type: none"> 1. Academic 2. Government 3. Academic 4. Academic 5. Government 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. France 6. South Africa 7. South Africa 8. United States 9. United Kingdom 10. South Africa
<p>UNIVERSITY OF VENDA</p> <p>39% International Collaboration</p> <p>29% Only national Collaboration</p> <p>23% Only institutional collaboration</p> <p>9% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of KwaZulu-Natal 2. University of Johannesburg 3. University of Pretoria 4. University of South Africa 5. Rhodes University 6. North-West University 7. University of The Free State 8. University of the Witwatersrand 9. University of Virginia 10. National Research Foundation 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Government 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. United States 10. South Africa
<p>UNIVERSITY OF ZULULAND</p> <p>37% International Collaboration</p> <p>30% Only national Collaboration</p> <p>17% Only institutional collaboration</p> <p>16% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of KwaZulu-Natal 2. University of Johannesburg 3. Stellenbosch University 4. South African Medical Research Council 5. North-West University 6. University of Pretoria 7. Council for Scientific and Industrial Research 8. University of the Western Cape 9. Afe Babalola University 10. University of The Free State 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Government 5. Academic 6. Academic 7. Government 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. Nigeria 10. South Africa

OVERALL GEOGRAPHICAL COLLABORATION	TOP TEN INSTITUTIONS COLLABORATING WITH THE UNIVERSITY	SECTOR	COUNTRY
<p>VAAL UNIVERSITY OF TECHNOLOGY</p> <p>30% International Collaboration</p> <p>29% Only national Collaboration</p> <p>33% Only institutional collaboration</p> <p>9% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1.Tshwane University of Technology 2.University of Johannesburg 3.University of South Africa 4.University of the Witwatersrand 5.North-West University 6.University of KwaZulu-Natal 7.Council for Scientific and Industrial Research 8.Central University of Technology 9.Redeemer's University 10.University of Ibadan 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Government 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. Nigeria 10. Nigeria
<p>WALTER SISULU UNIVERSITY</p> <p>39% International Collaboration</p> <p>32% Only national Collaboration</p> <p>18% Only institutional collaboration</p> <p>11% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of Cape Town 2.University of Johannesburg 3.University of Fort Hare 4.Stellenbosch University 5.University of the Witwatersrand 6.University of KwaZulu-Natal 7.South African Medical Research Council 8.University of The Free State 9.University of Pretoria 10.University of South Africa 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Government 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. South Africa
<p>DURBAN UNIVERSITY OF TECHNOLOGY</p> <p>44% International Collaboration</p> <p>20% Only national Collaboration</p> <p>24% Only institutional collaboration</p> <p>12% Single authorship (no collaboration)</p>	<ol style="list-style-type: none"> 1. University of KwaZulu-Natal 2. King Faisal University 3. University of the Witwatersrand 4. University of Johannesburg 5. Mangosuthu University of Technology 6. University of Cape Town 7. University of Pretoria 8. University of South Africa 9. North-West University 10. Covenant University 	<ol style="list-style-type: none"> 1. Academic 2. Academic 3. Academic 4. Academic 5. Academic 6. Academic 7. Academic 8. Academic 9. Academic 10. Academic 	<ol style="list-style-type: none"> 1. South Africa 2. South Africa 3. South Africa 4. South Africa 5. South Africa 6. South Africa 7. South Africa 8. South Africa 9. South Africa 10. Nigeria



SOCIETAL IMPACT MEASURED THROUGH POLICYMAKING

Due to the extremely broad scope of research outputs at universities, it is challenging to demonstrate the societal impact of these research outputs. To glimpse the societal impact of the research done at the public universities in South Africa, we have obtained data from SciVal's Research Intelligence Office indicating where research outputs focusing on the Sustainable Development Goals (SDGs) have been cited in policy documents. The citations of these research outputs in policy documents show how the research affects local, national, international, and regional policymaking²².

According to the data gathered, a total of 17465 research outputs are cited in policies, both nationally and internationally. Again, SDG 3 Good Health and Wellbeing stands out as the SDG that has had the most impact concerning policymaking (Figure 4).

Figure 4 - Total number of outputs cited by policy documents nationally and internationally.

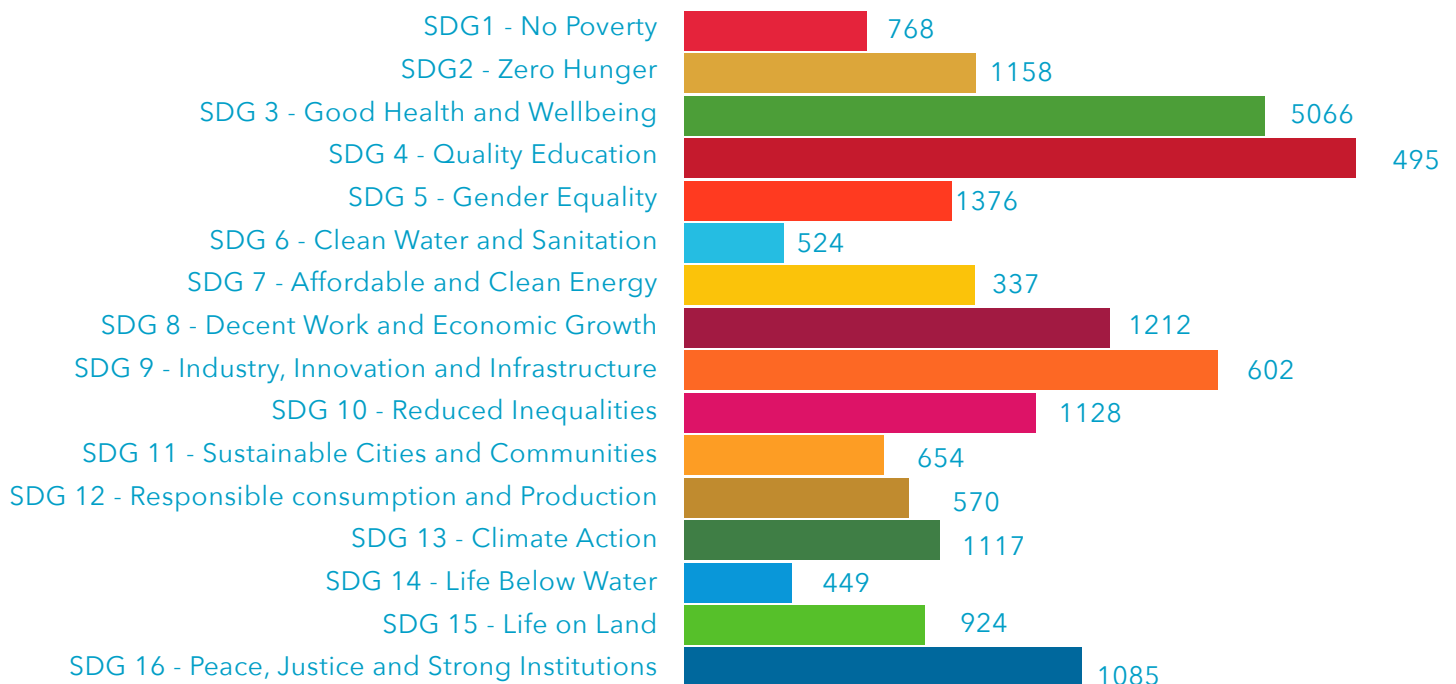
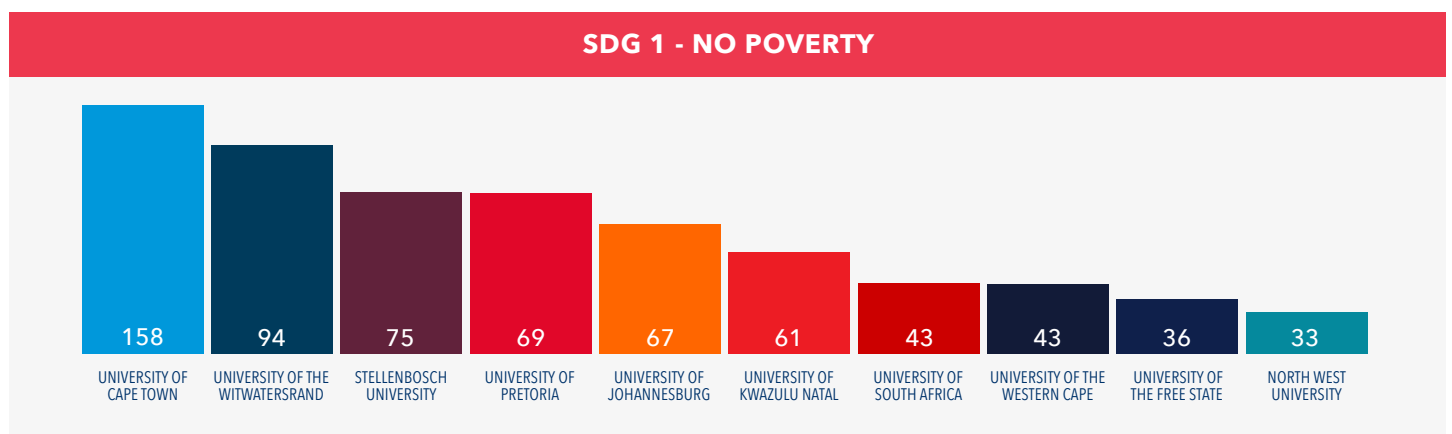
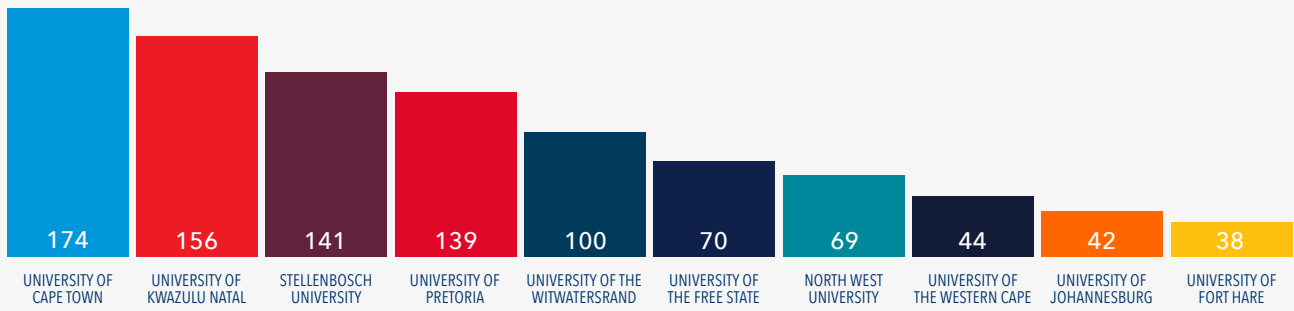


Table 7 indicates how many of the research outputs produced by the public universities in South Africa have been cited by policies, both nationally and internationally. The University of Cape Town has contributed most to policy documents in 12 of the first 16 SDGs.

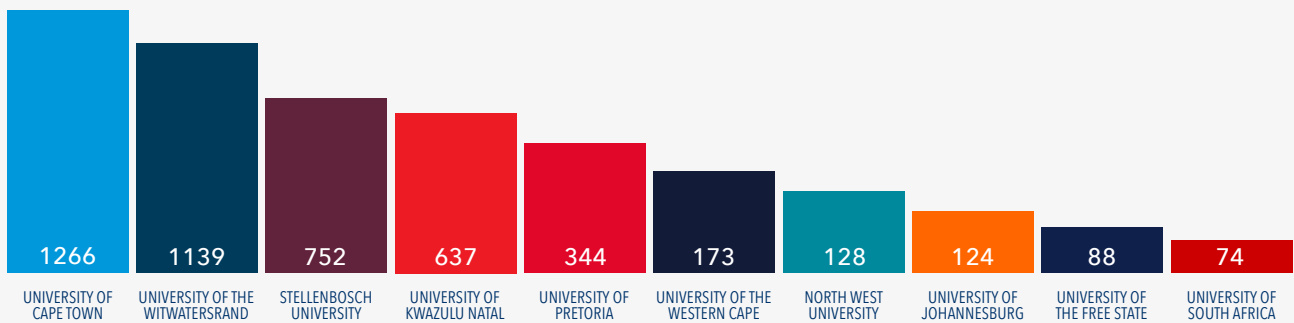
Table 7 - Research outputs cited by policy documents.



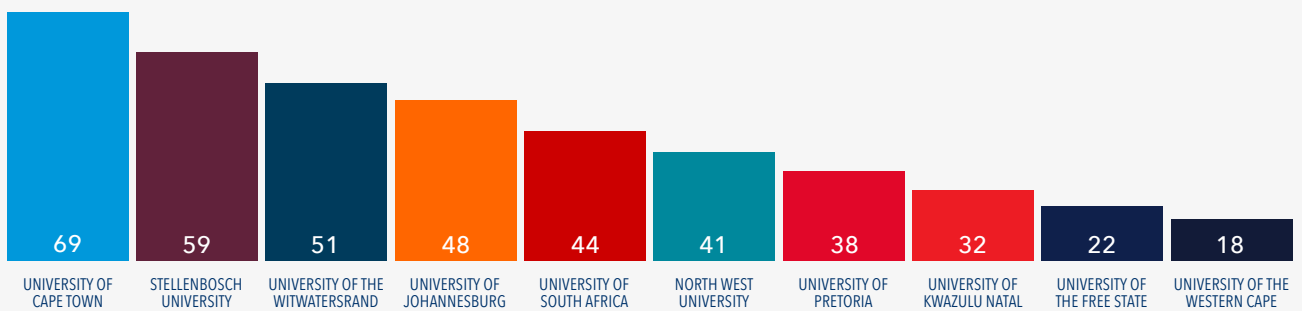
SDG 2 - ZERO HUNGER



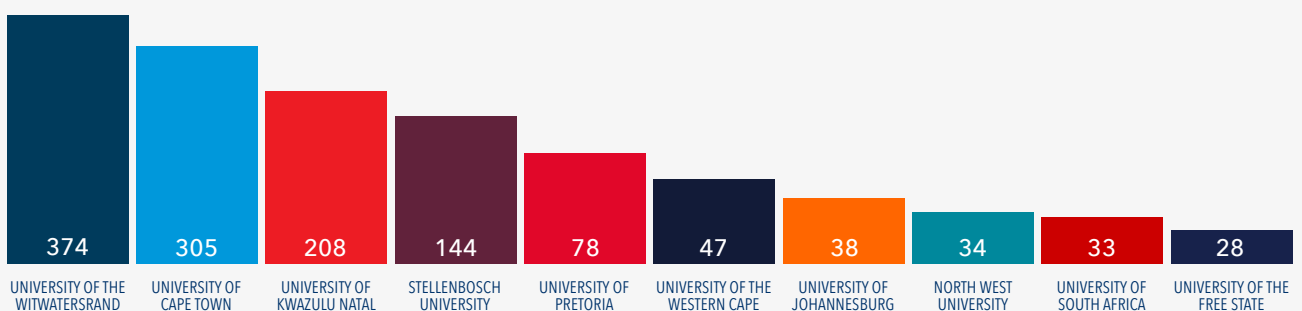
SDG 3 - GOOD HEALTH AND WELLBEING



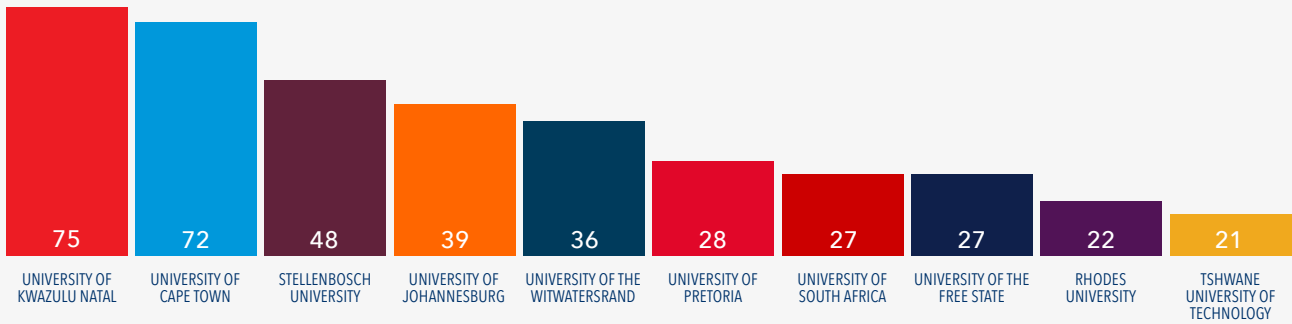
SDG 4 - QUALITY EDUCATION



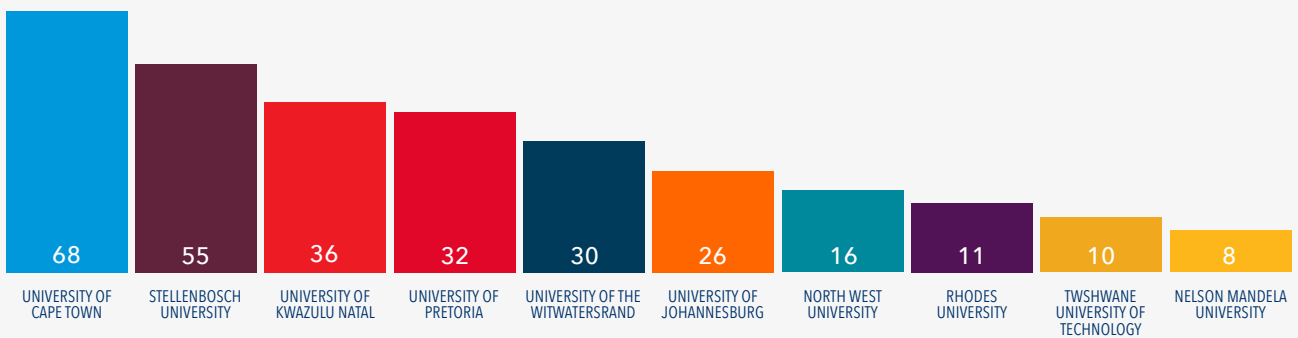
SDG 5 - GENDER EQUALITY



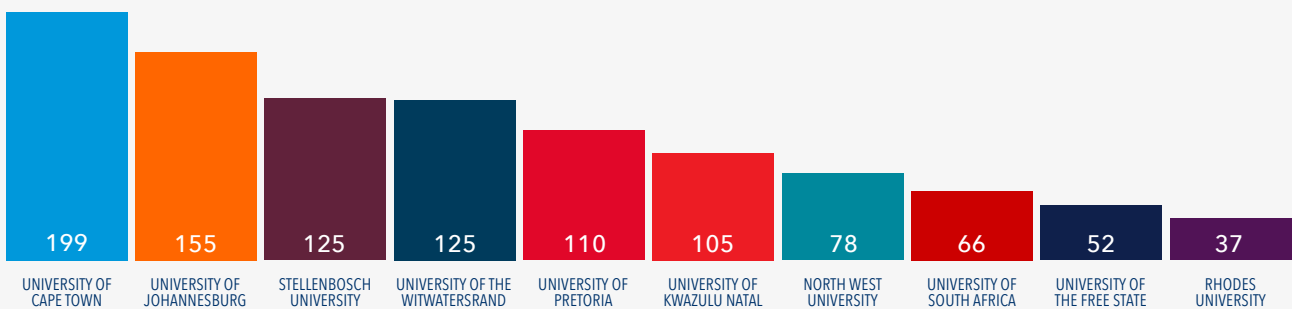
SDG 6 - CLEAN WATER AND SANITATION



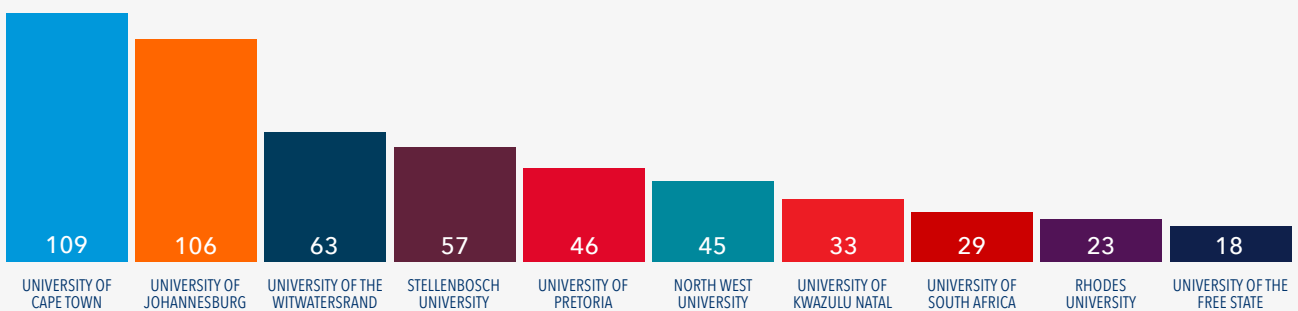
SDG 7 - AFFORDABLE AND CLEAN ENERGY



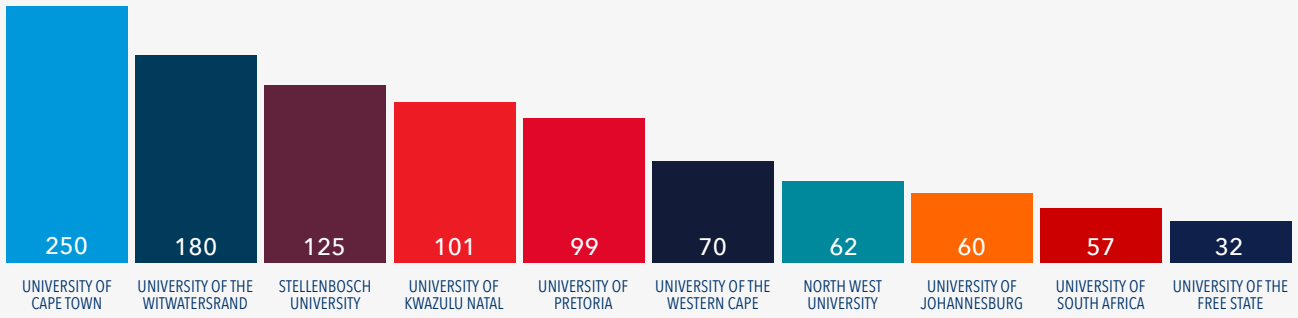
SDG 8 - DECENT WORK AND ECONOMIC GROWTH



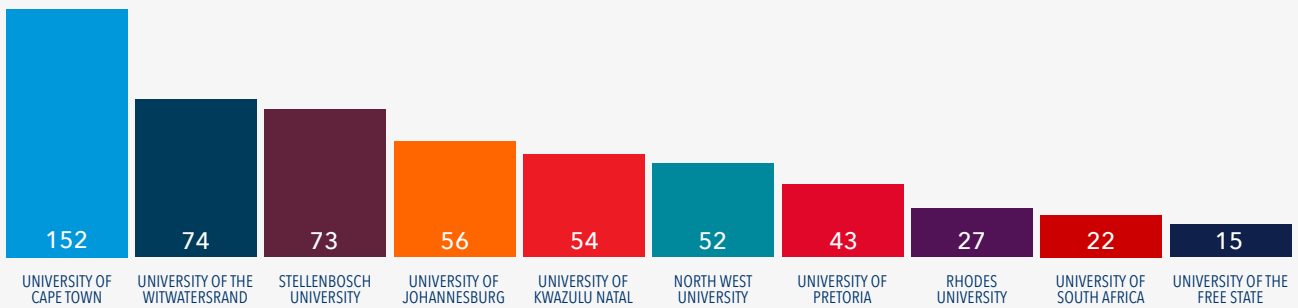
SDG 9 - INDUSTRY, INNOVATION AND INFRASTRUCTURE



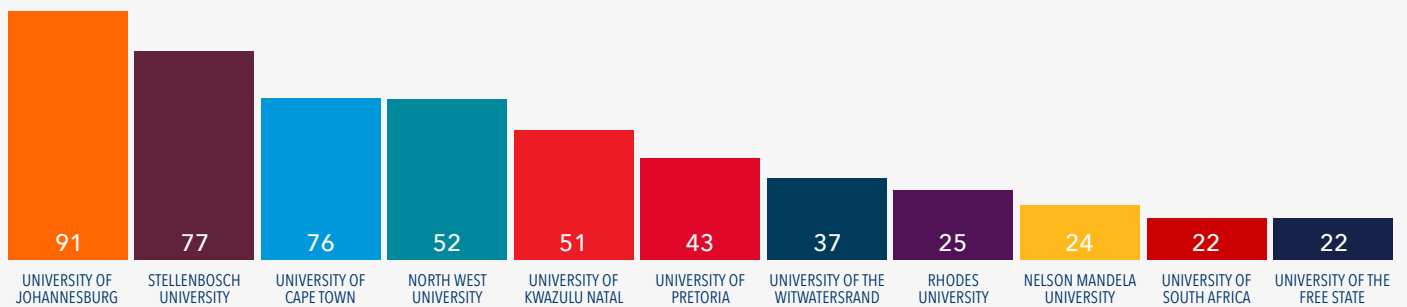
SDG 10 - REDUCED INEQUALITIES



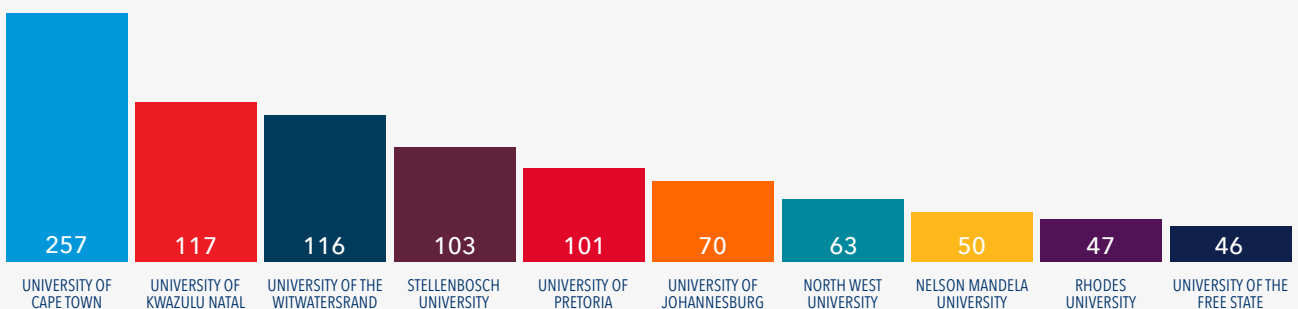
SDG 11 - SUSTAINABLE CITIES AND COMMUNITIES



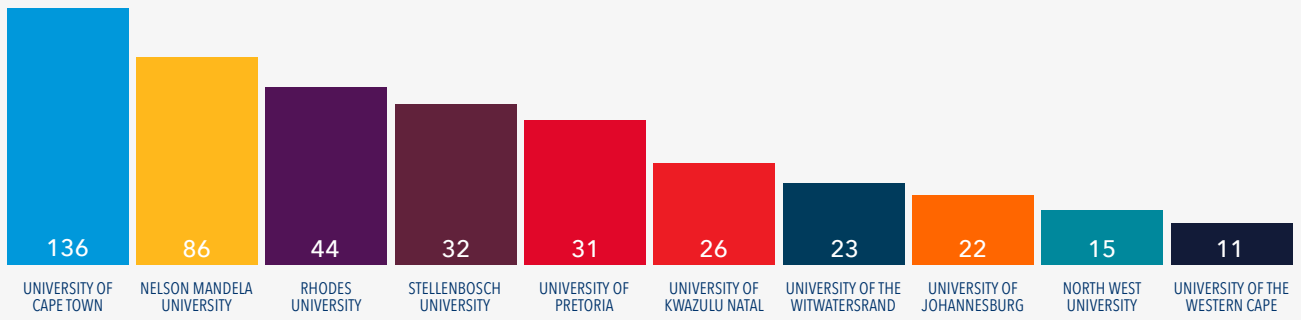
SDG 12 - RESPONSIBLE CONSUMPTION AND PRODUCTION



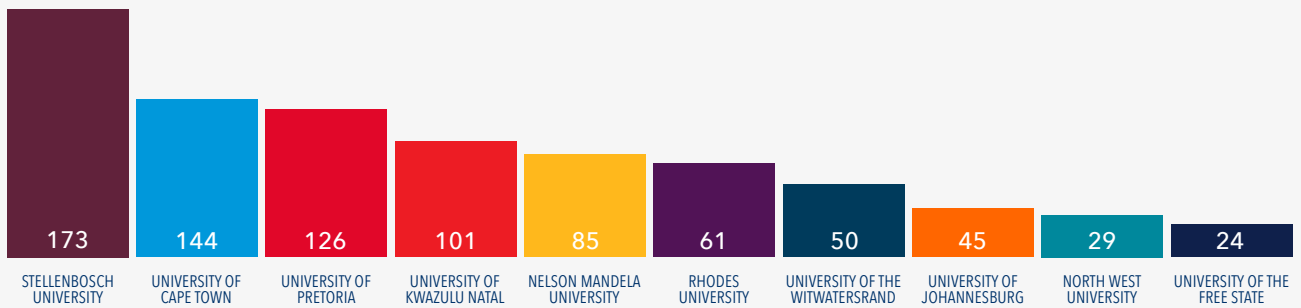
SDG 13 - CLIMATE ACTION



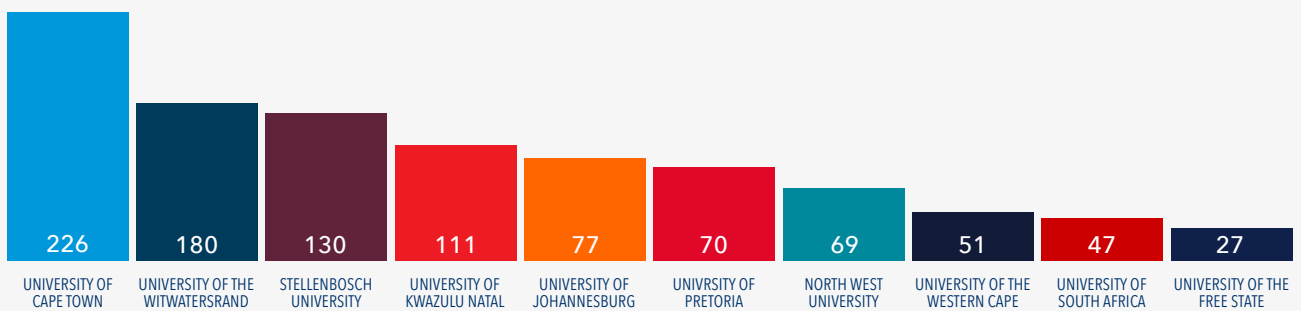
SDG 14 - LIFE BELOW WATER



SDG 15 - LIFE ON LAND



SDG 16 - PEACE, JUSTICE AND STRONG INSTITUTIONS



TIMES HIGHER EDUCATION (THE) IMPACT RANKINGS

Times Higher Education (THE) developed a set of performance metrics in 2018 and published it as a league table at the THE Innovation and Impact Summit in April 2019. In 2020, the scope of the rankings was extended, measuring universities across all 17 Sustainable Development Goals (SDGs). The aim of the THE Impact Rankings is to show how the global higher education sector is working towards achieving the United Nations' SDGs ²³.

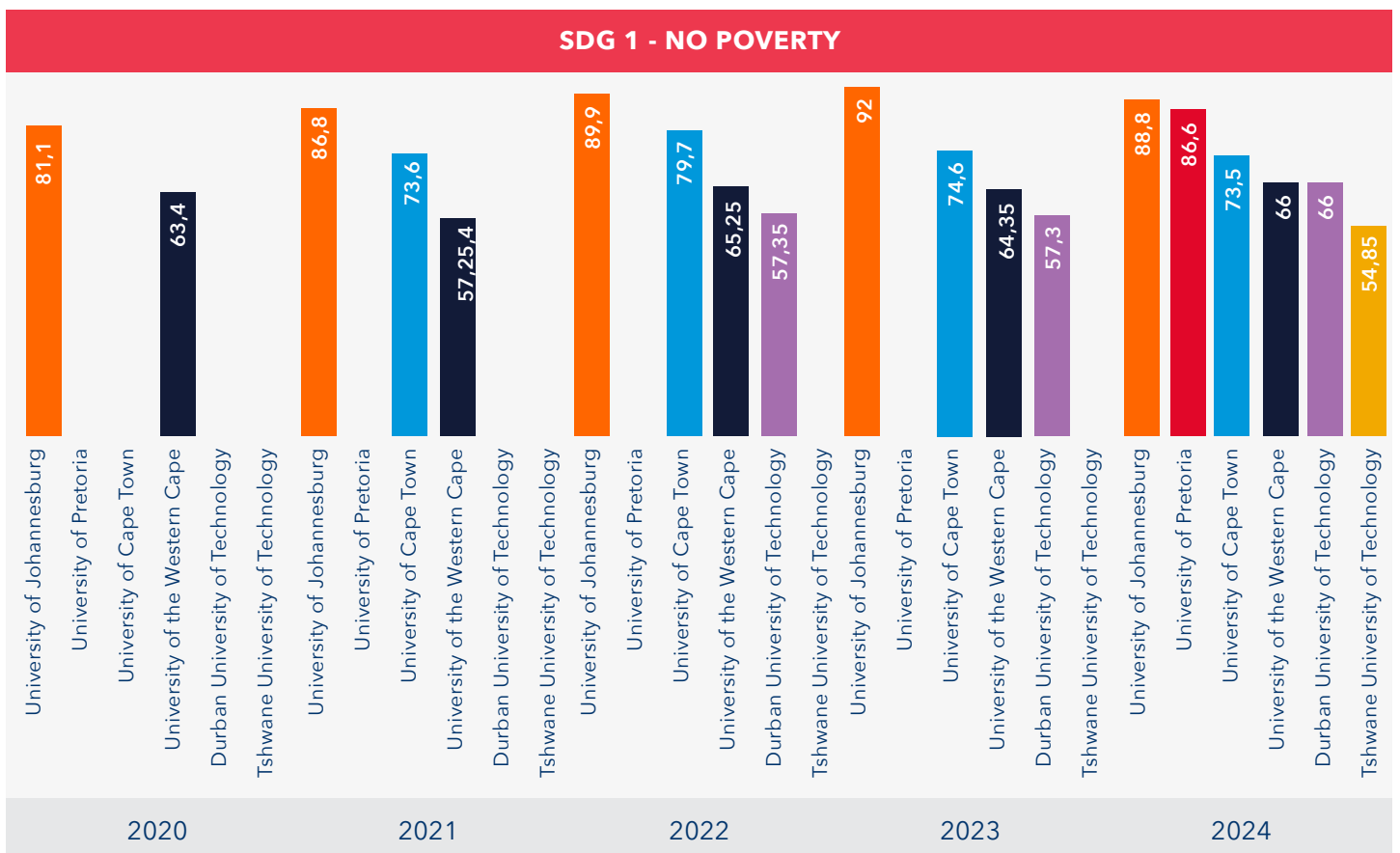
Data collected for the THE Impact Rankings comes from a variety of sources, including the direct submission of data from each individual university and bibliometric datasets from Elsevier (similar to what has been used for the results of this report) ²³.

Table 8 shows the results of the THE Impact Rankings for South African Universities from 2019 to 2024. As is the case with total research publication outputs, the University of Johannesburg has delivered exceptional contributions to the SDGs according to the THE rankings, as they have been ranked number one nationally and have gained rankings within the top 100 since 2020, with a global ranking of 36th in 2024. According to the THE rankings, the University of Pretoria and the University of Cape Town have also significantly contributed to the SDGs, taking the second and third positions nationally over the past six years. In 2023, the University of Pretoria had a global ranking of 69th and, in 2024, 42nd, with the University of Cape Town ranking 77th globally in 2024.

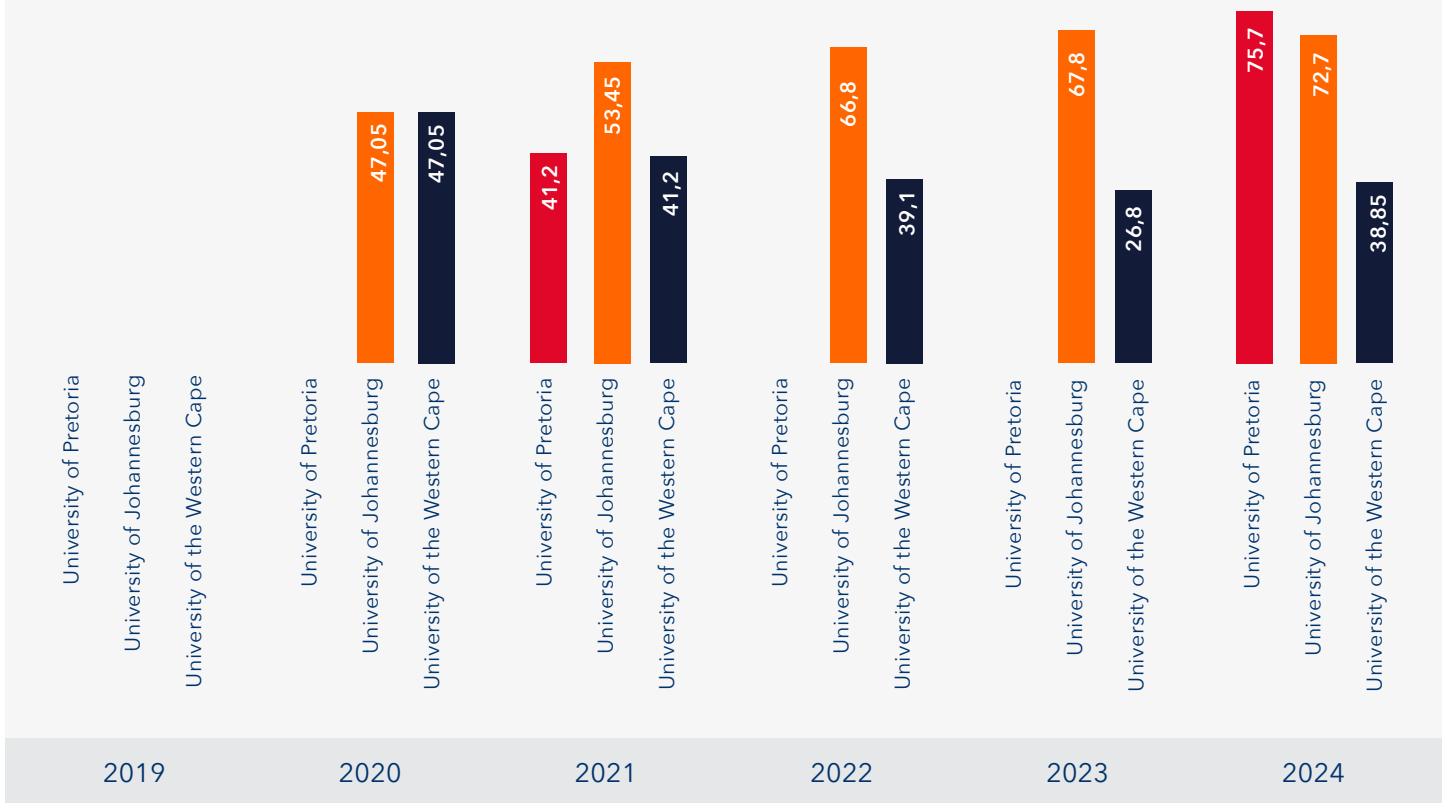
It is important to note that only ten Public Universities in South Africa have participated in the rankings over the past six years, making this data incomparable with the collected data in this report. However, it showcases strengths and opportunities regarding participating universities' contributions towards the SDGs.

TABLE 8

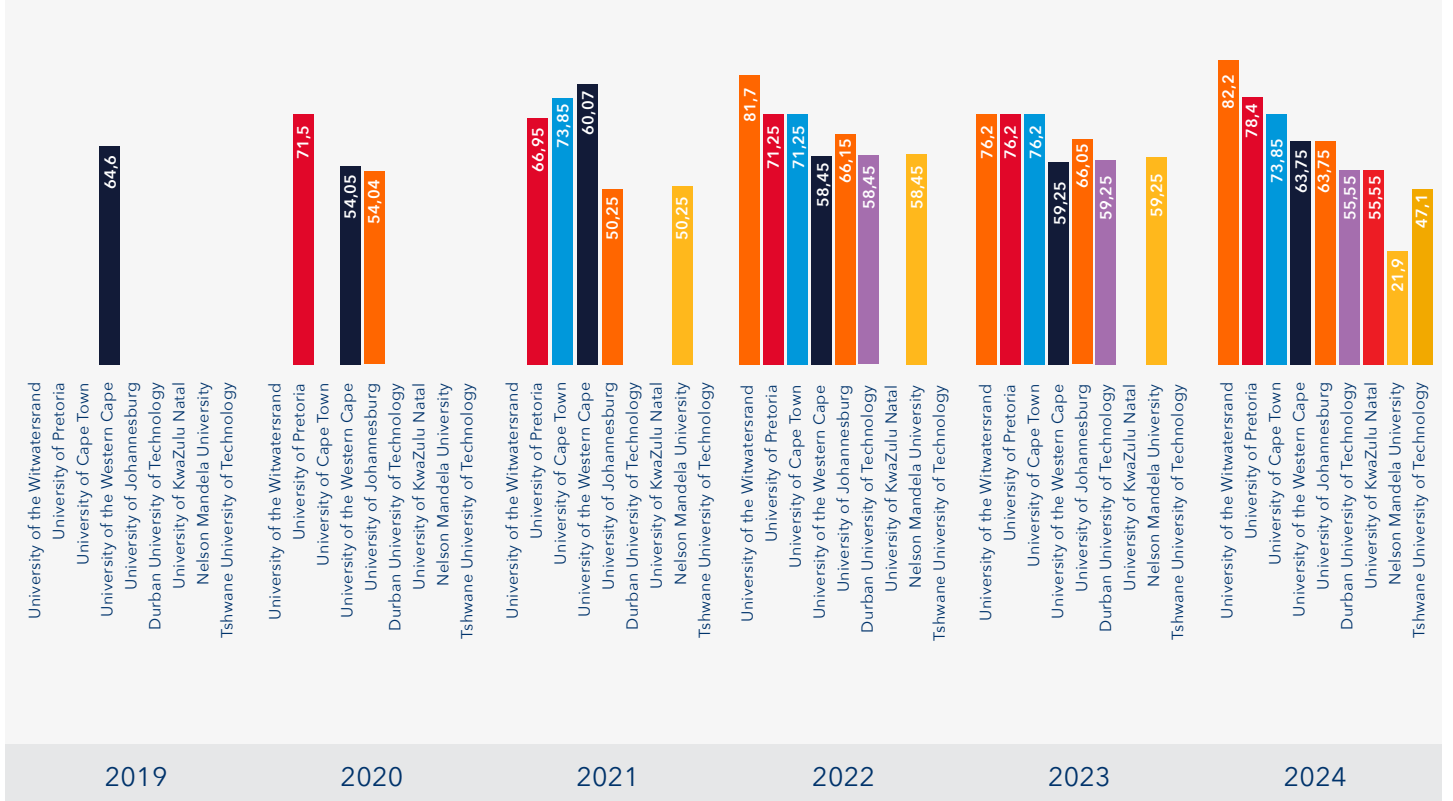
Times Higher Education Impact Rankings Results (2019 - 2024)



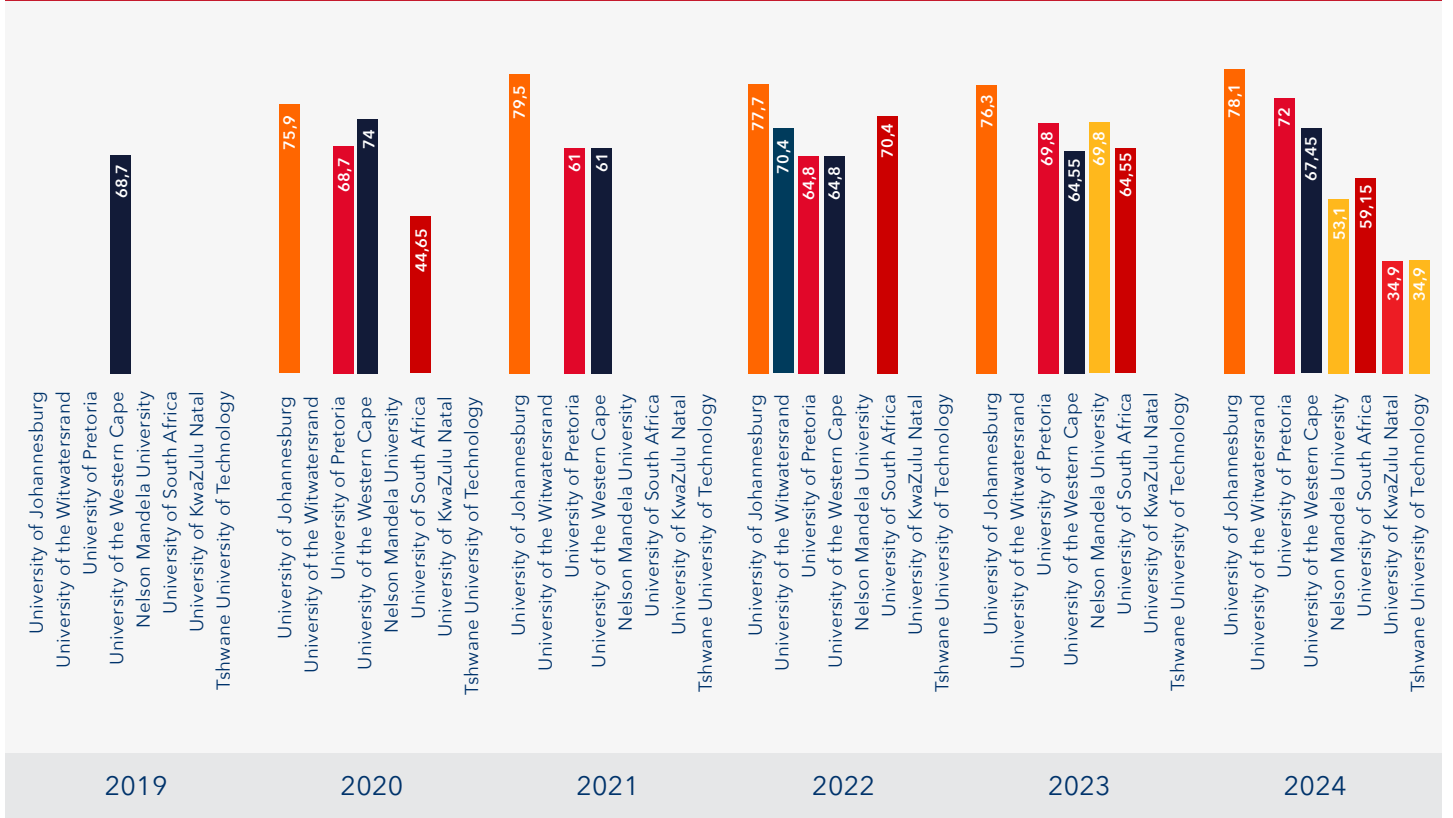
SDG 2 - ZERO HUNGER



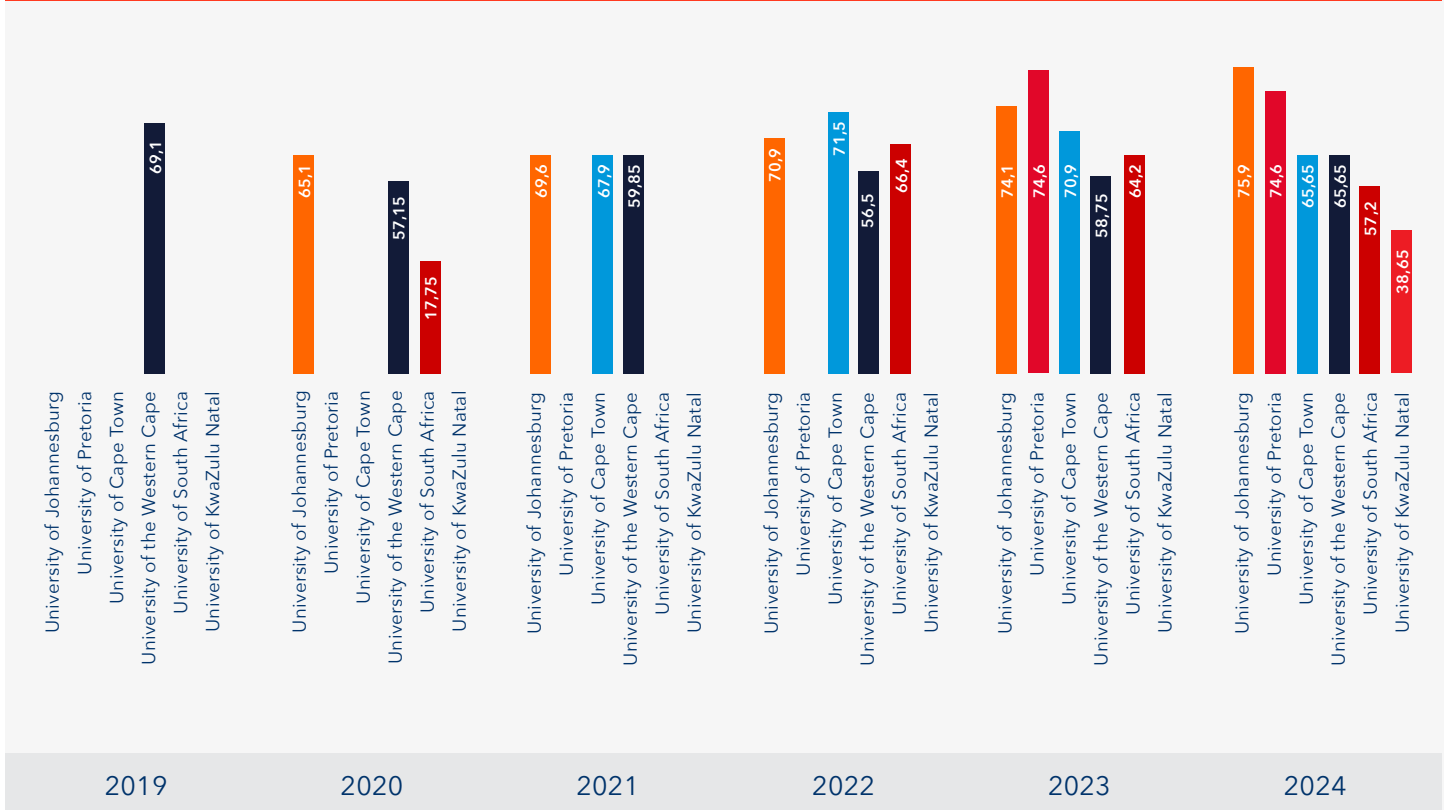
SDG 3 - GOOD HEALTH AND WELLBEING



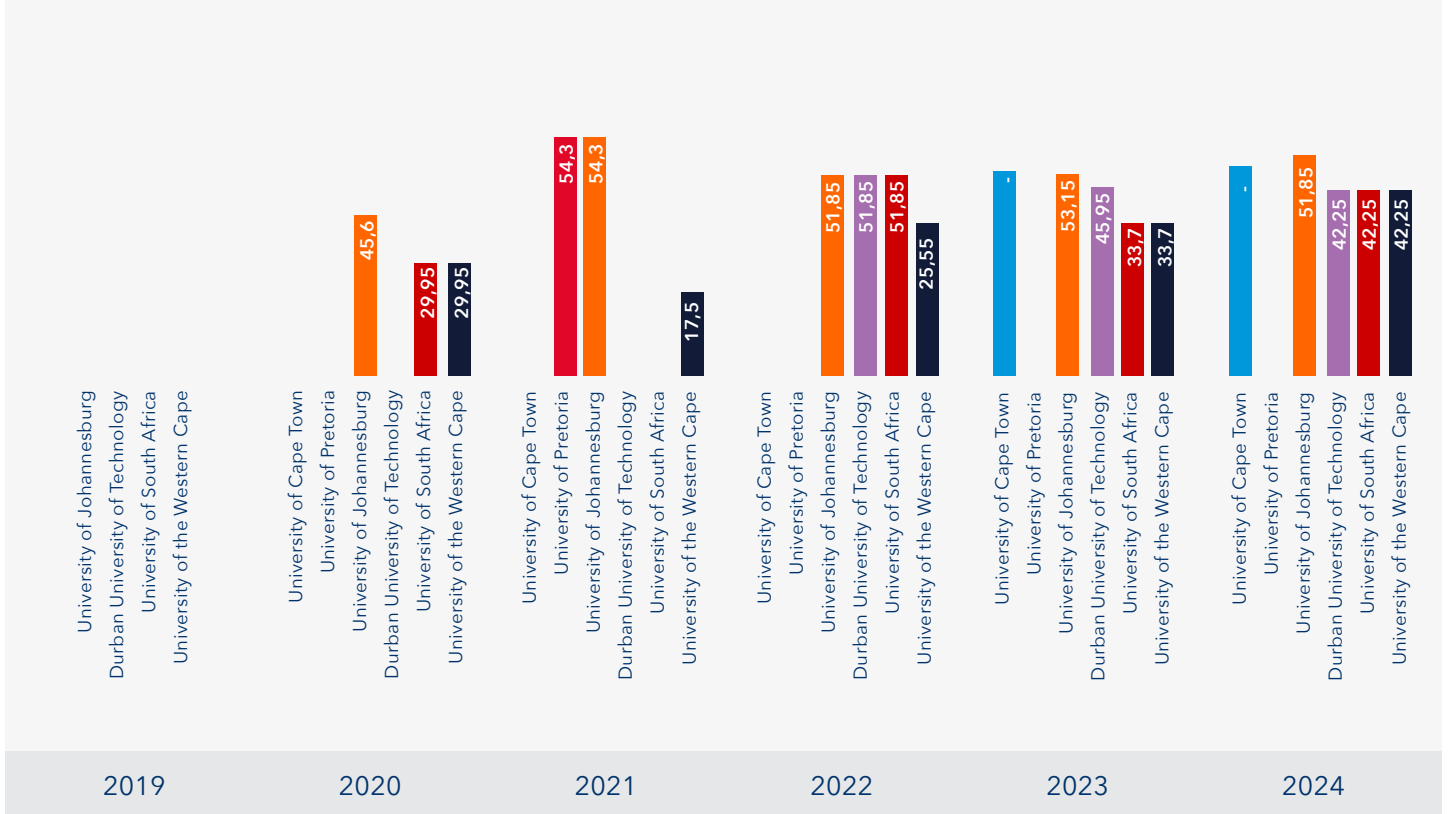
SDG 4 - QUALITY EDUCATION



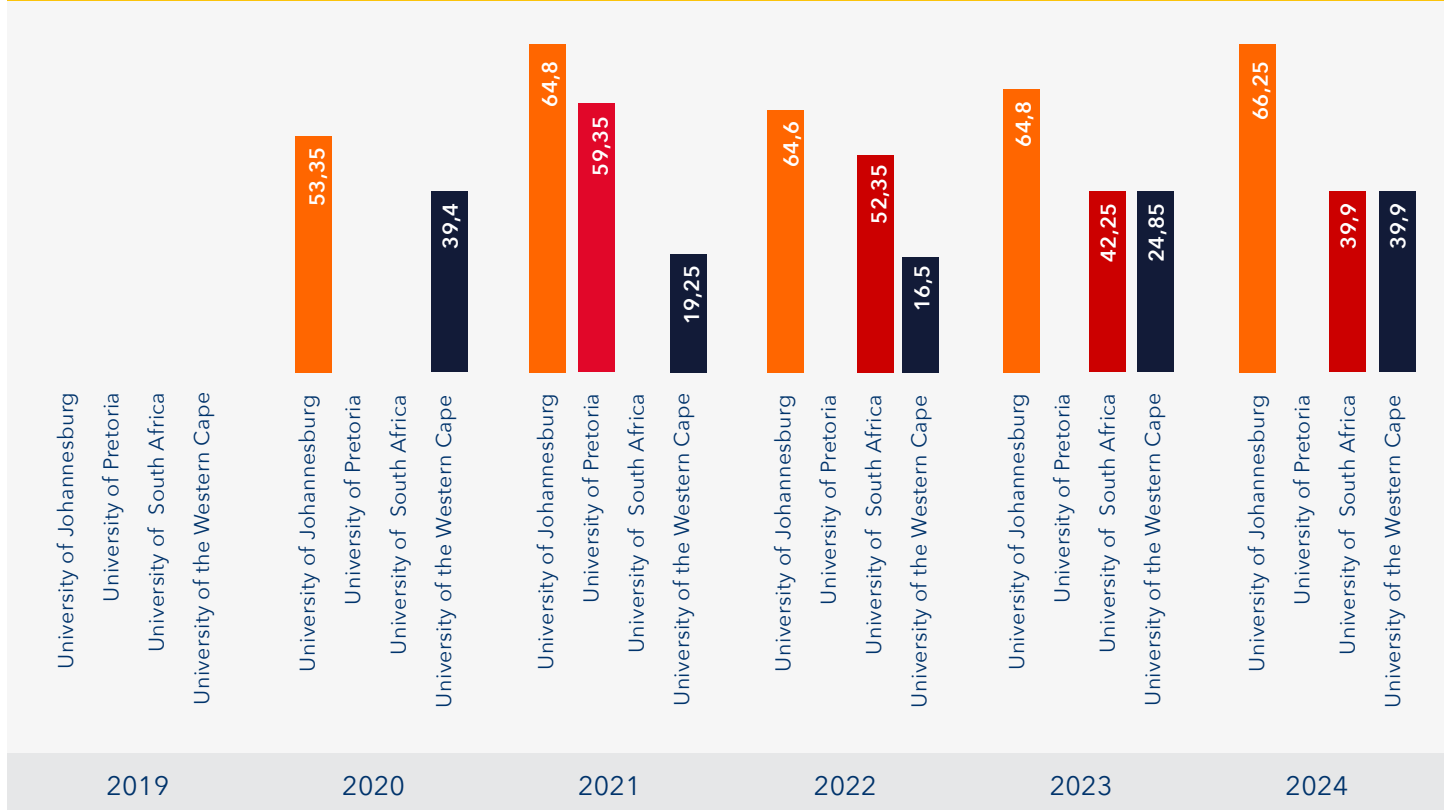
SDG 5 - GENDER EQUALITIES



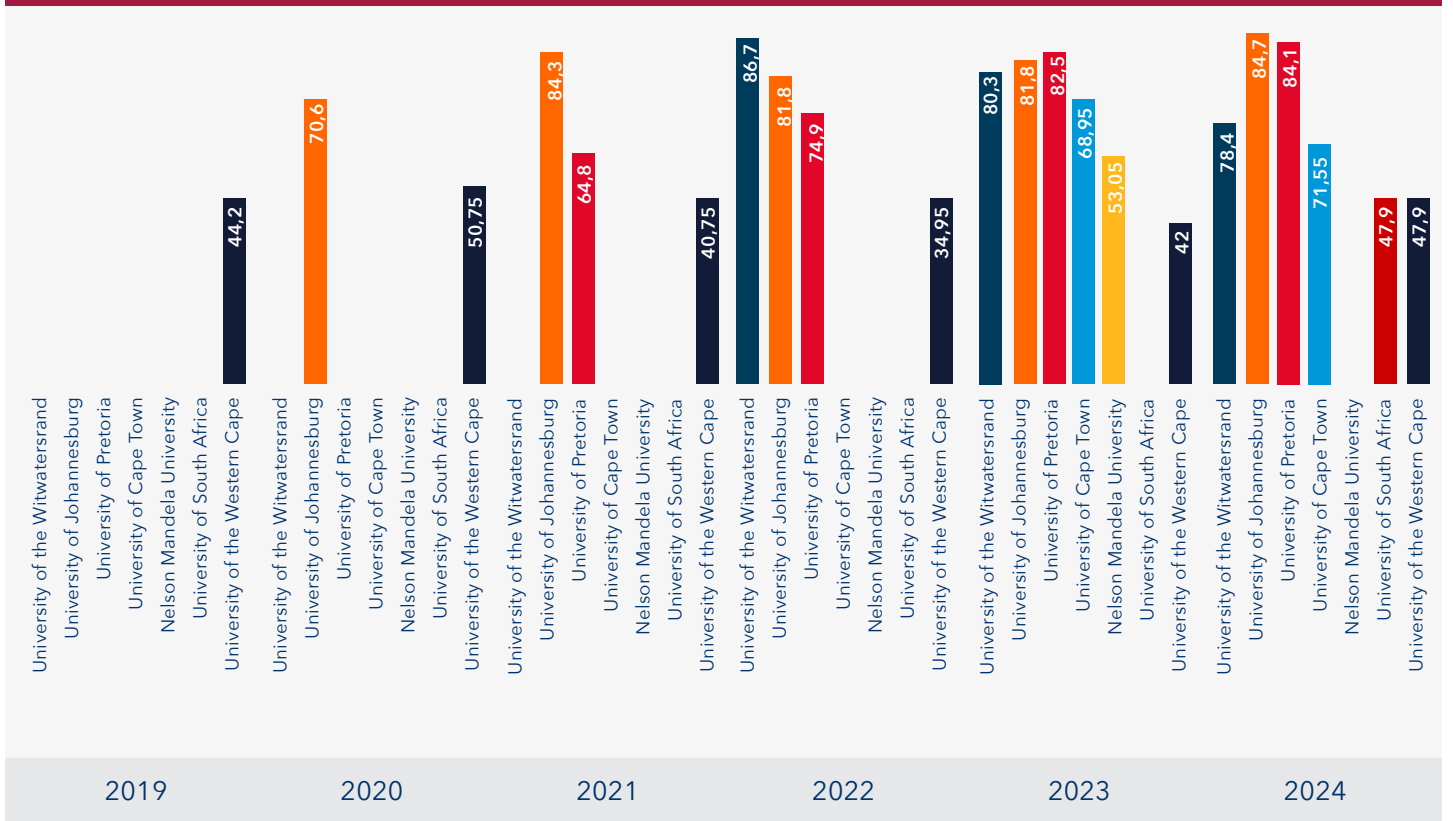
SDG 6 - CLEAN WATER AND SANITATION



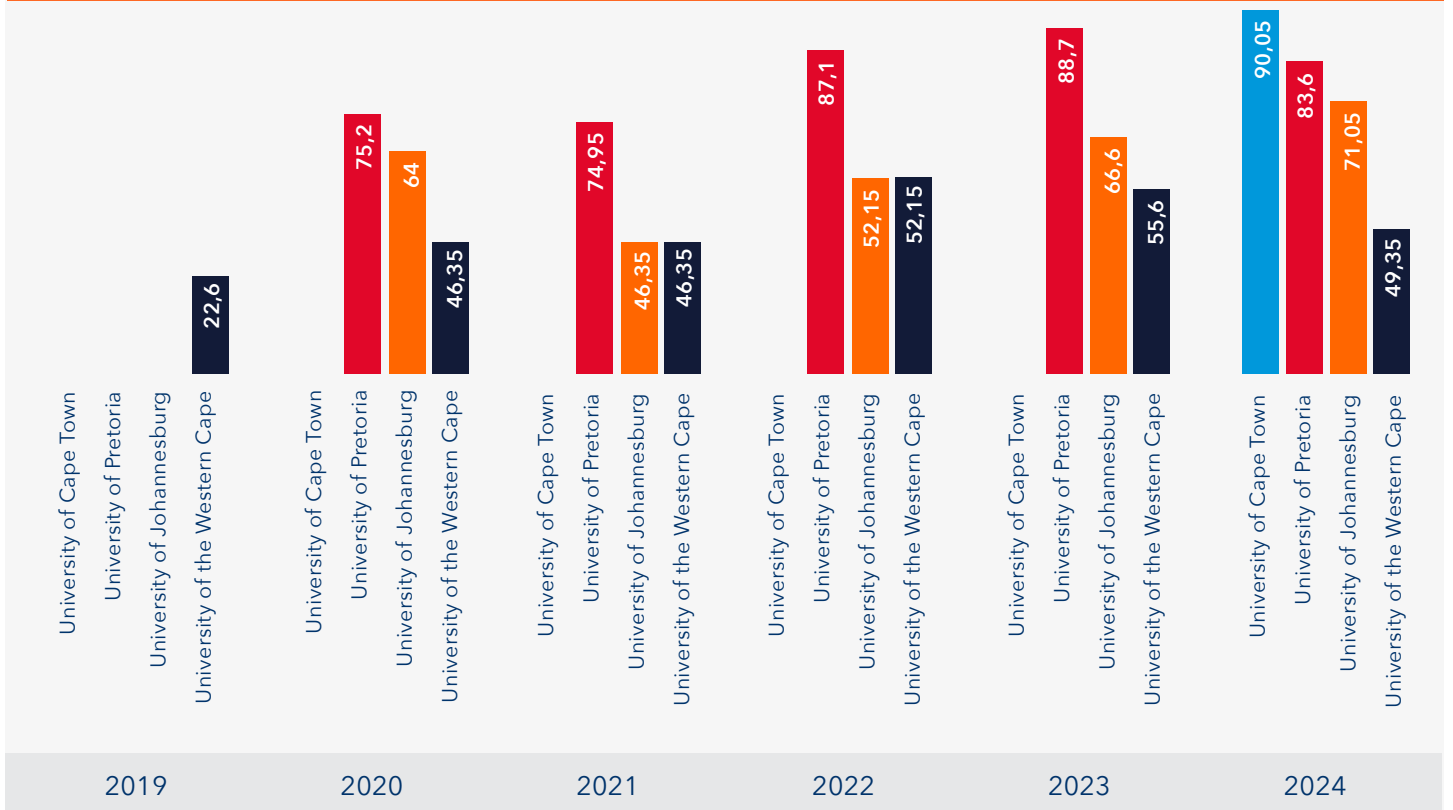
SDG 7 - AFFORDABLE AND CLEAN ENERGY



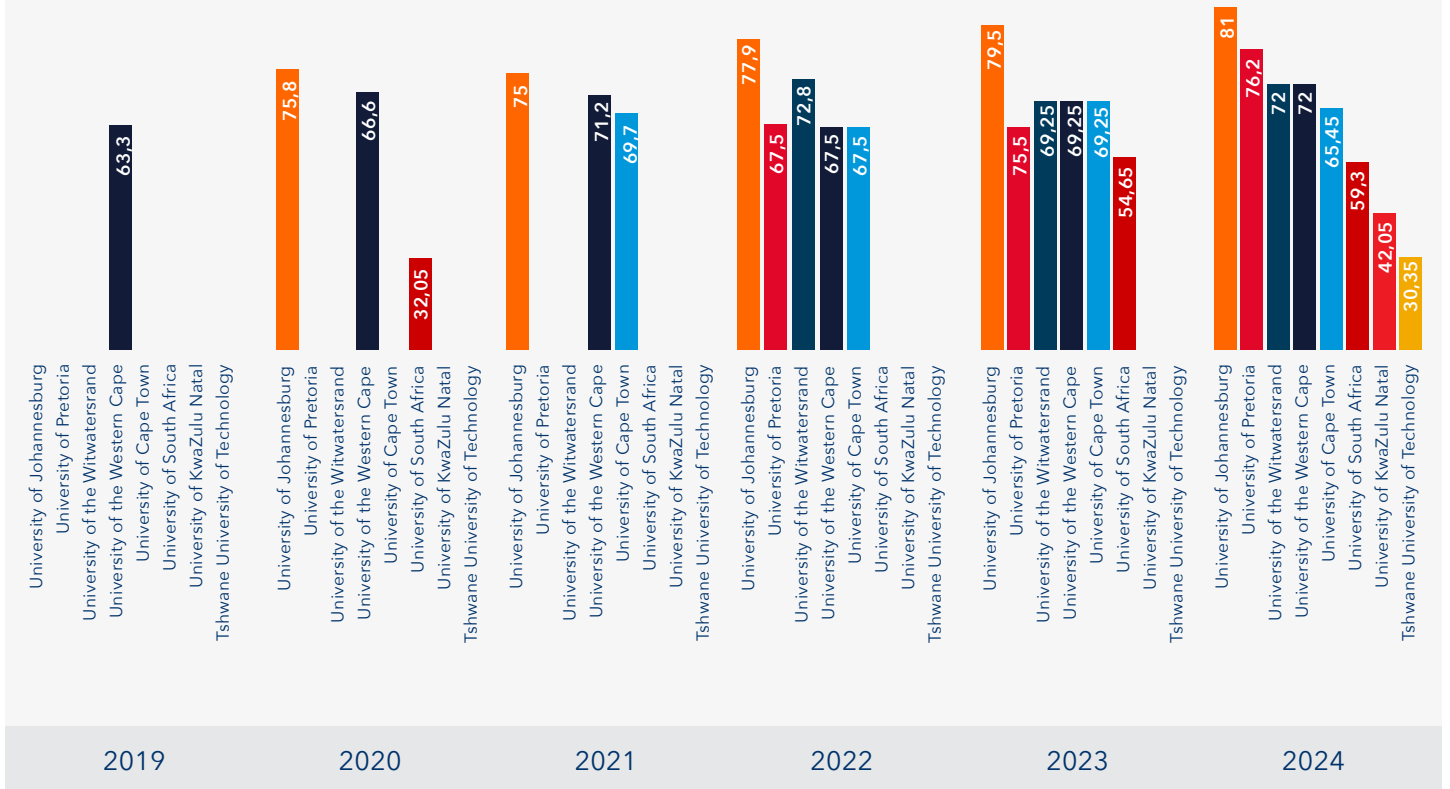
SDG 8 - DECENT WORK AND ECONOMIC GROWTH



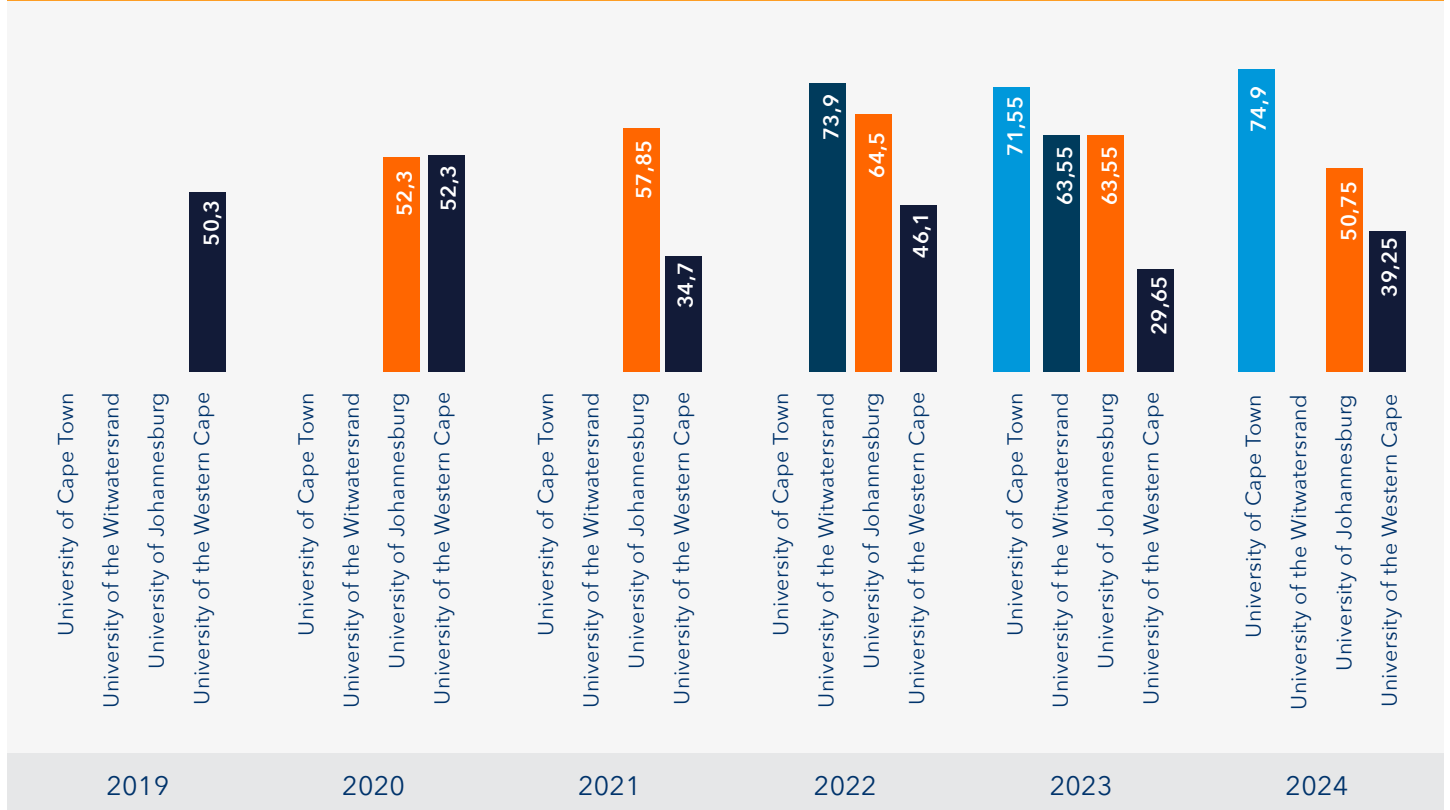
SDG 9 - INDUSTRY, INNOVATION AND INFRASTRUCTURE



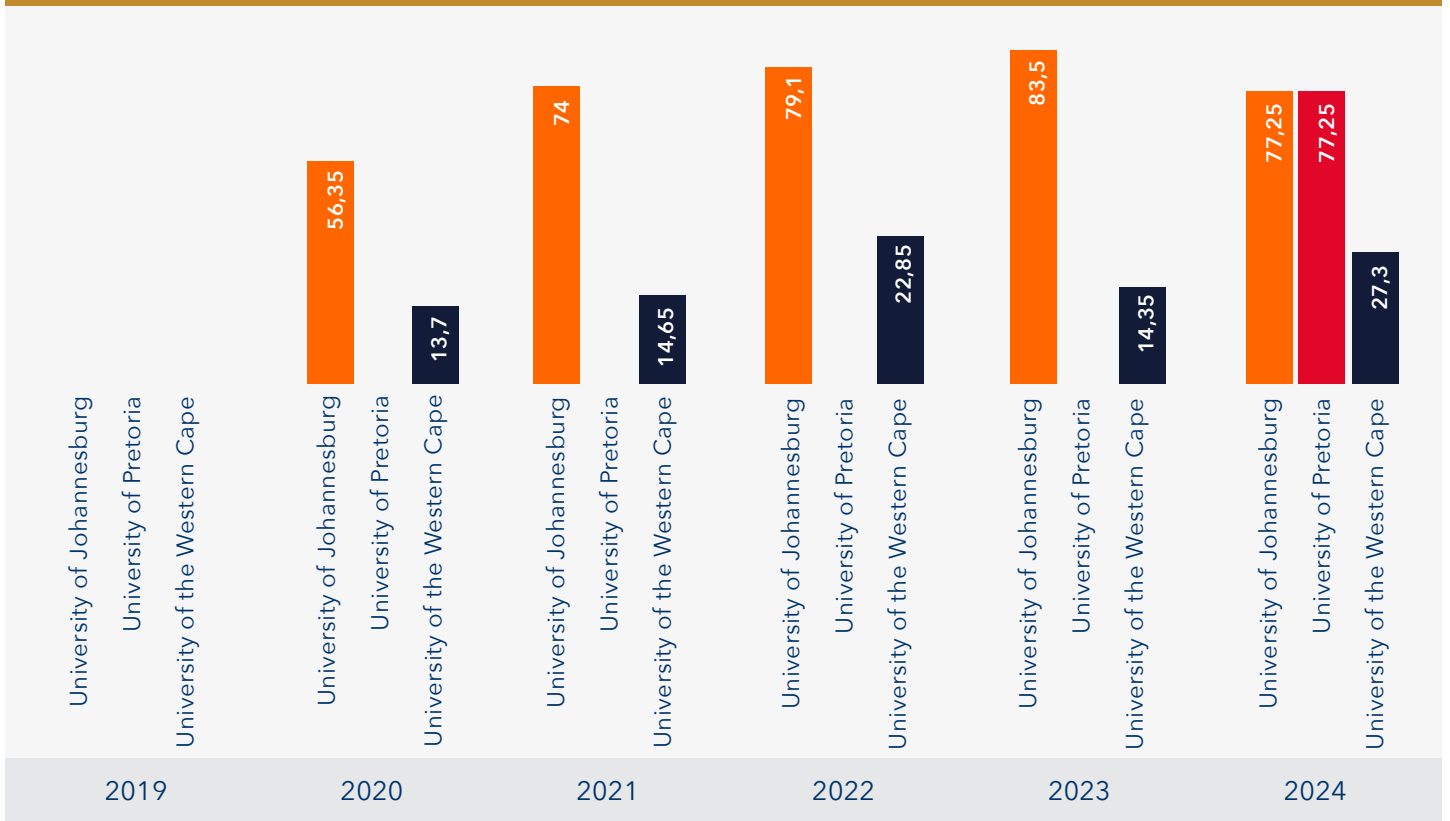
SDG 10 - REDUCED INEQUALITIES



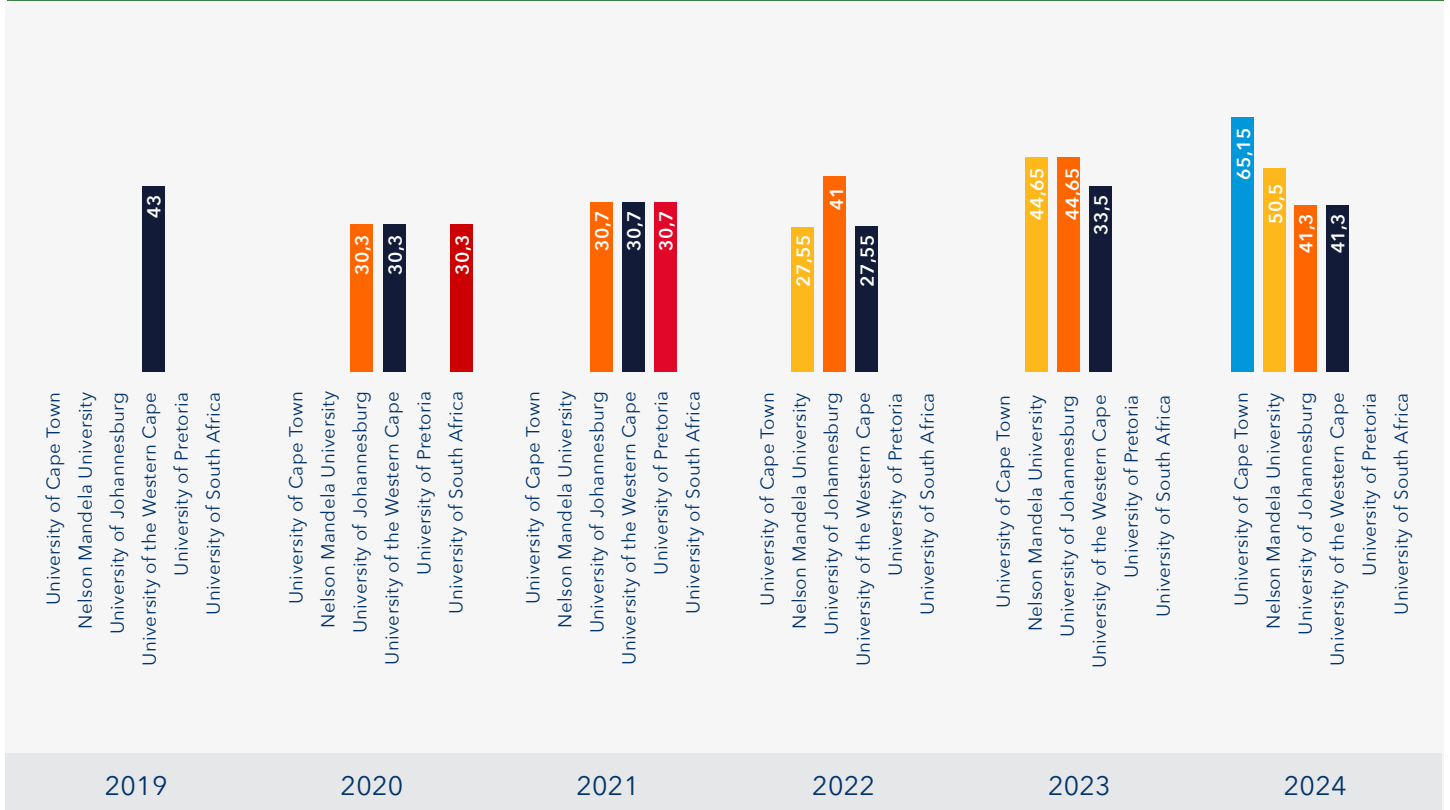
SDG 11 - SUSTAINABLE CITIES AND COMMUNITIES



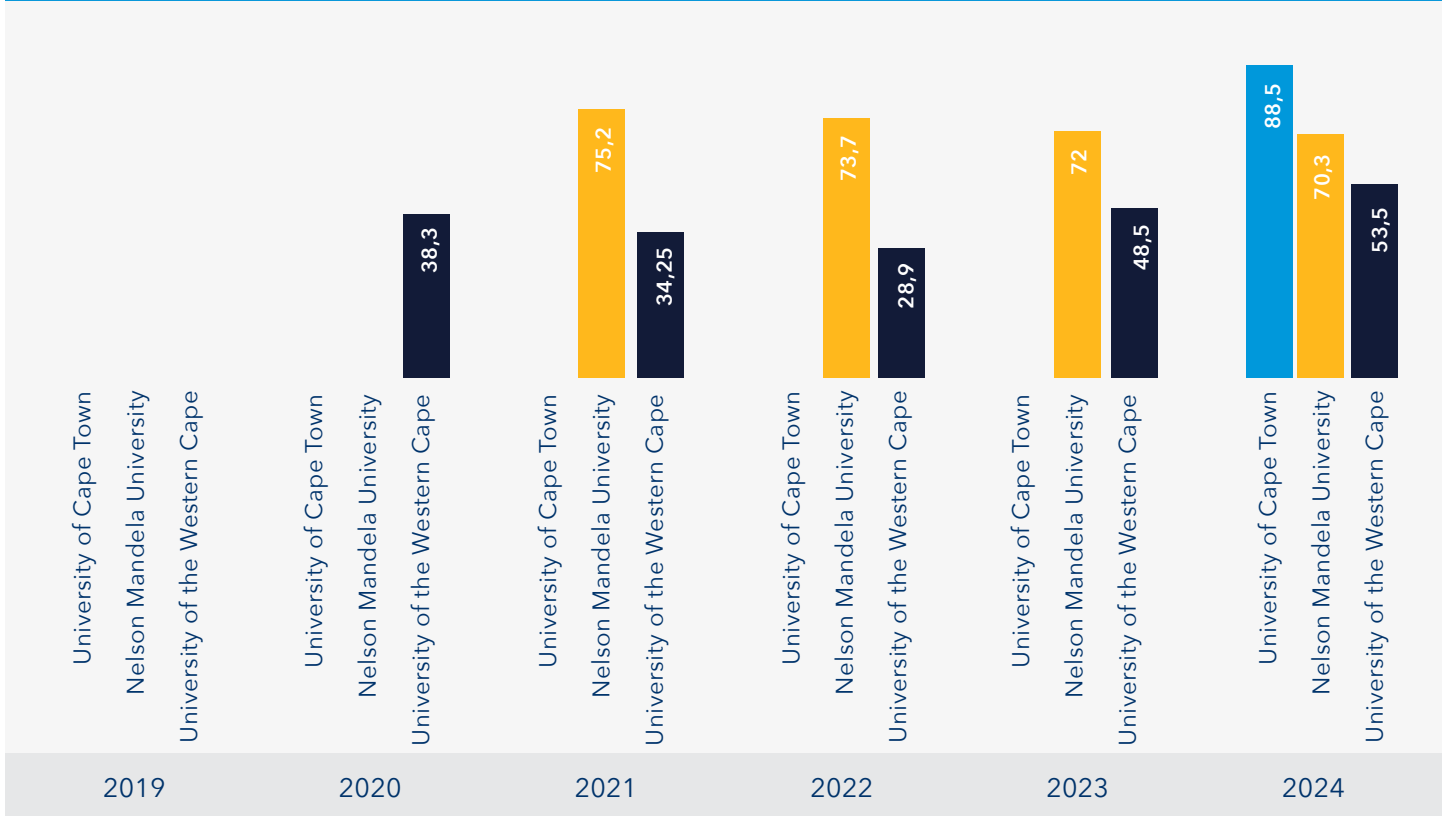
SDG 12 - RESPONSIBLE CONSUMPTION AND PRODUCTION



SDG 13 - CLIMATE ACTION



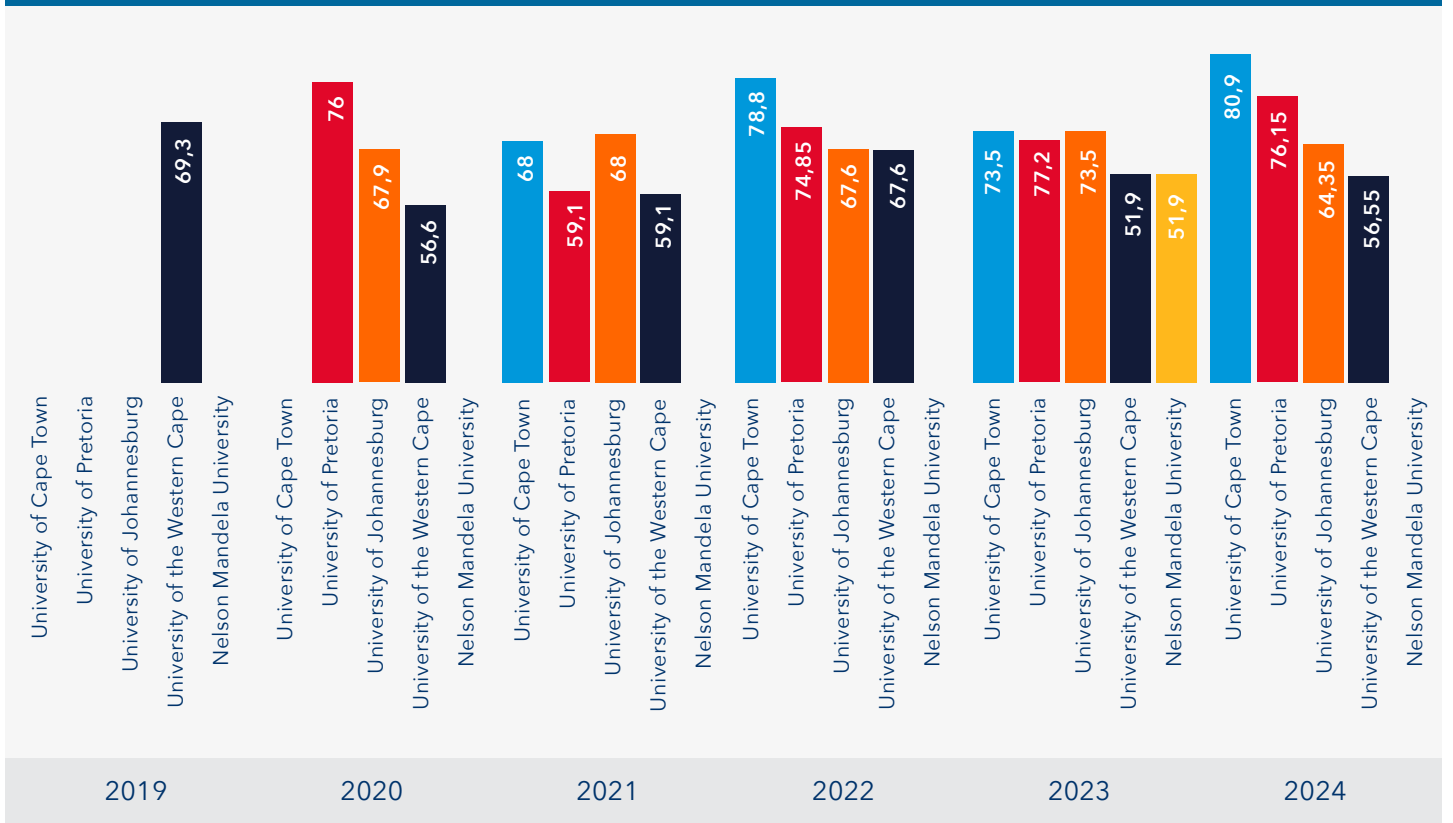
SDG 14 - LIFE BELOW WATER



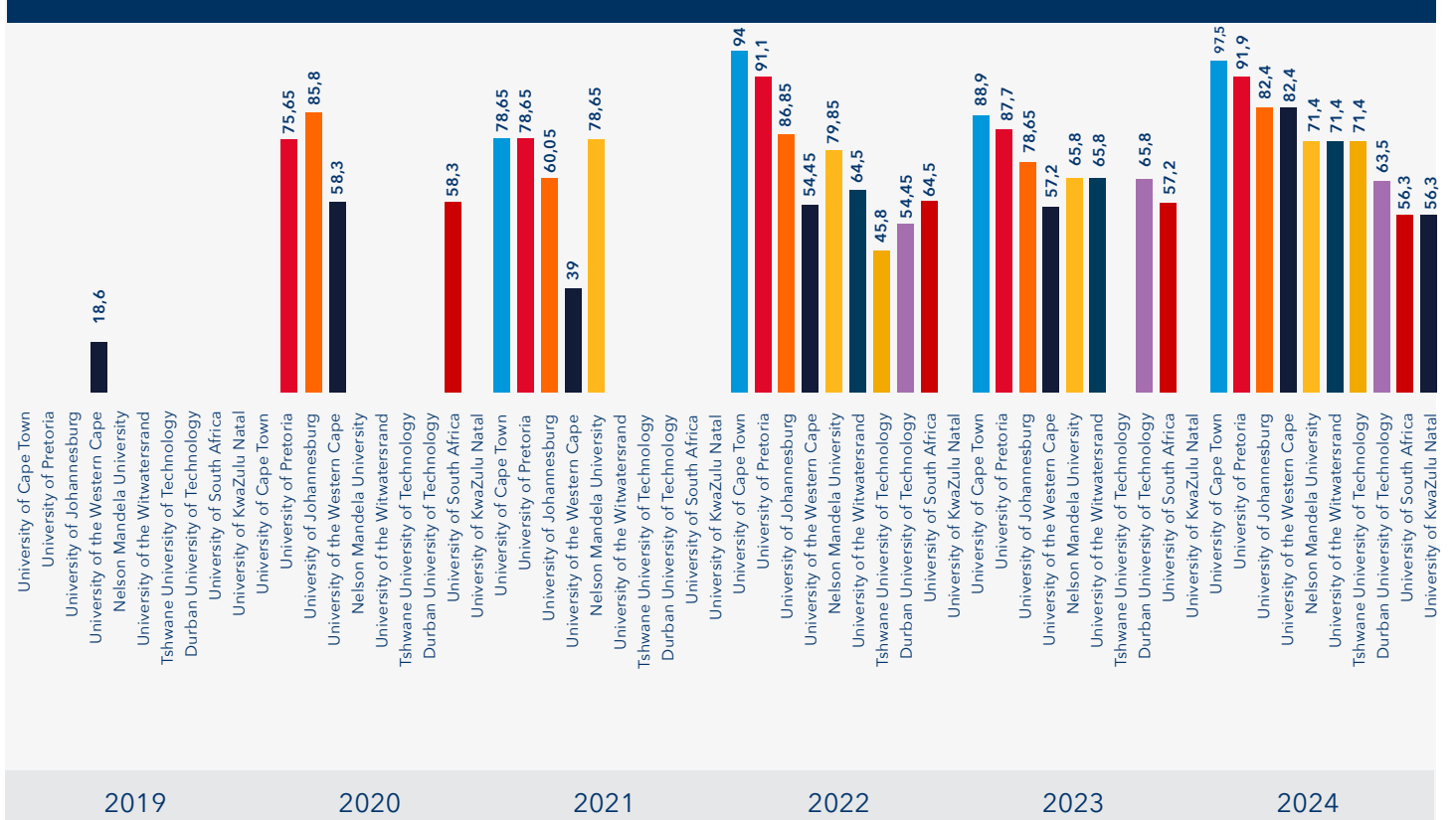
SDG 15 - LIFE ON LAND



SDG 16 - PEACE, JUSTICE AND STRONG INSTITUTIONS



SDG 17 - PARTNERSHIPS FOR THE GOALS







CONCLUSION

The data that has been collected clearly shows that several South African Universities are taking the lead in contributing towards the SDGs in the fight against the challenges facing humanity and securing a sustainable future for all. The University of Johannesburg, the University of Cape Town, and Rhodes University are among those who have been making significant contributions.

SDG 3 Good Health and Wellbeing is the SDG that has been addressed the most, as seen in data from total research outputs and research and annual reports. These research outputs have also been cited most in policies, as can be expected, as this is the SDG most represented in Centres of Excellence and SARChI Chairs.

Some of the SDGs that need urgent attention are SDG 1 No Poverty and SDG 14 Life Below Water. Many people in South Africa live in poverty. It is thus of utmost importance for South African universities to focus on and increase their contribution to SDG 1. Given the geospatial location of some of the universities in South Africa and their involvement in research networks such as the South African Environmental Observation Network (SAEON), SDG 14 Life Below Water creates an opportunity for South African universities to make a significant contribution to the attainment of Agenda 2030.

This study has highlighted the importance of capturing data regarding research conducted at South African Universities to showcase the impact of our work. It has also highlighted opportunities for further research, especially regarding individualised assessments at universities and the creation of an assessment and data-capturing system for South African Universities.

ADDENDUM 1

FEEDBACK FROM UNIVERSITIES' DVCS

01 Universities contribution and alignment with SDGs

In relation to this question, responses show that University of Johannesburg (UJ) has made significant contributions towards SDGs 7, 8, and 9, while the University of Witwatersrand (Wits) highlighted contributions on SDGs 3, 10, and 16 in its submission. The University of Free State (UFS) reported progress on SDGs 2, 3, 6, 7, 13, 15, and 16, while the focus of Central University of Technology (CUT) is on SDGs 2, 3, 4, 6 and 13. The University of Venda (UNIVEN) related that there alignment with SDGs 2, 3, 6, and 15 while North West University (NWU) affirmed that its work aligns with SDGs 2, 3, 8, 12, 16. Stellenbosch University (SU) asserted that it has contributed to SDGs 3, 7, 9 and 15 while the University of Zululand (UZ) affirmed significant contribution on SDGs 3, 4, 8 and 9. The UWC reported contributions to SDGs 1, 3, 5, 10, 16 and 17.

02 Measures being taken to focus more on neglected SDGs

A range of measures are being taken on neglected SDGs by the universities under review. UJ reported that it has acquired funding especially for projects relating to SDGs 6, 9, 11, 13, 14 and 15 while UZ emphasised the need for strategic funding. Wits and UFS profiled research outputs and engagement with stakeholders to highlight alignment with SDGs. Regarding SDG 4, especially, UNIVEN is establishing formal partnerships with traditional councils, while NWU is engaging with stakeholders, an approach it is also using regarding SDG 13. Considering the strength of its research chairs/centres of excellence, SU and UWC did not indicate any further specific measure.

03 Position of Public Universities in South Africa in addressing SDGs

On this question, UFS, Wits, and UNIVEN viewed that through diverse research approaches, public universities are addressing challenges and contributing to the realisation of multiple SDGs. However, UJ noted that the lack of funding by the government is a major hinderance. NMU reaffirmed that universities are well positioned to contribute in that they serve as hubs of knowledge, innovation, and social change. While public universities work on SDGs, UZ viewed that it is problematic that enough work is not being done on the widening inequalities in South Africa. UWC asserted that institutions need more collaboration and collective efforts to make a real impact.

04 Science Innovation and Technology that advance SDGs

UJ has initiatives including village's diesel and solar borehole pump, installation of a network of taps, solar lights, streetlights, communal drip irrigation system, and a solar bakery in the Limpopo province. Projects implemented by Wits include the Smartsport system and PecoPower. UFS has developed early warning systems, precision farming technologies, water sanitation technologies, and introduced e-learning platforms to make quality education easily accessible to communities. UNIVEN has memorandums with traditional leadership of communities that allow for applied research while NWU has initiated agricultural innovations to combat hunger, health technologies to improve wellbeing and sustainable production methods. SU has a range of successful initiatives that can be found on their Research for Impact platform while UZ has just appointed a TTO manager. Through its COE projects, UWC focused on people in rural areas and poor communities.

05 Local/International Partnerships and Collaborations

UJ, UFS, NWU, UZ and Wits supported the need for partnership with local and international entities. CUT, especially, partners with the AI Institute of South Africa, local municipalities for water quality enhancement and pollution monitoring initiatives, and international research networks focusing on sustainable development and technological innovation. UNIVEN hosts a database that addresses social protection, which is aligned with SDGs 1 while SU host initiatives such as the SciMathUS program, the Centre for Collaboration in Africa, and the Southern African Network of Water Centres of Excellence. UWC is involved in an EU funded SDG project that focuses on participatory approaches to implementing SDGs.

06 Possible areas of complementary partnerships among universities

UJ, NWU, SU, UZ, UWC and UNIVEN agreed that partnerships among South African universities are necessary to pool resources together in responding to SDGs. UFS suggested joint funding proposals, research co-supervision, and knowledge sharing as possible areas of partnership. Wits highlighted the importance of collaboration for interdisciplinary activities on SDGs in form of collaborative/inter-institutional Chairs/CoEs especially to address issues such as unemployment, poverty, and inequality that are of SDGs significance. UWC suggested that other universities implement SDGs led by one university across the country.

07 Final thoughts

UFS described the significant role being played by its Vision 130 on SDGs alignment. Other suggestions include the Publication Quality Framework Programme at SU, the need for improved collaboration by UZ and NWU, while no final thoughts are found in the submissions by UJ, UNIVEN, UWC and CUT.

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