

Curriculum Vitae: Dr G Zuma-Netshiukhwi

ID: 7610100484084, Drivers Licence: Code 10/C1

Roodewal Smallholdings, Plot 31 Portion 1, Jan Steyl Avenue, Mangaung PO Box 100502, Renosterspruit 9328

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A. Personal Details

Name: Dr Gugulethu Zuma-Netshiukhwi
Gender: Female
Marital Status: Married
Nationality: South African
Location: Bloemfontein (Willing to Relocate)
Current Organisation: Agricultural Council Research

B. ACADEMIC QUALIFICATIONS

Qualification	Year Obtained	Institution
Doctor of Philosophy in Agrometeorology	2013	University of the Free State
Higher Diploma in Agricultural Research for Development (ARD),	2005	University of Wageningen in partnership with Agricultural Research Council.
Master of Science in Agrometeorology	2004	University of the Free State
B.Sc. Agriculture	2001	University of the Free State
Matriculation	1995	Pholela High School

C. Professional Experience and knowledge

- 18 years practical experience on the Natural Resource Management matters
- 5 years in managerial experience in public entities
 - 2 years at Dihlwai Food and Agricultural Services as a Training Manager, and
 - 3 years at Agricultural Research Council as Acting Programme Manager
- Profound understanding in Research for Development, technology transfer and information dissemination
- Sound experience with programme development, project development, programme management and performance monitoring
- Highly developed interpersonal, analytical, written and verbal communication skills
- Effective and efficient team member in a multicultural, multidisciplinary and multi-stakeholder environment
- Ability to prepare research proposals, write well organised reports and analyse complex information and understand different perspectives
- Practical knowledge on agrometeorology, extension agrometeorology, agroforestry, climate change adaptation, crop modelling and agro-advisory development
- Ability to work under pressure and tight deadlines independently and engage all parties involved when necessary.
- Energetic, self-driven, focused, result oriented with high level of honesty and integrity.

C. FOCAL AREAS OF EXPERTISE

- Pure agrometeorology, extension agrometeorology and agroforestry and climate change adaptation
- Climate data capturing, processing, analysis and interpretation for agricultural application and operation
- Development of early warning advisories and the impact of climate change to agriculture
- Crop modelling and development of tailor-made advisories for improved decision making

- Crop forecasting, climate analysis and its applications
- Use of weather forecast, climate prediction and seasonal forecasts by water users
- Micrometeorology and water relations in the soil/plant/atmosphere continuum, understanding the dynamics within and around crop canopy.
- Use of participatory approaches to disseminate agrometeorological information to different stakeholders and particularly farmers.
- Training, research and development and compilation of training modules and manuals on agricultural and climate related matters
- Contributing to balancing core operations and organisational priorities with contractual obligations of delivering to key government and stakeholders

D. Other formal training and qualifications

- **Advance Project Management Course:** 20210, University of Leeds, Online Courses.
- **Nyukela Public Service SMS Pre-entry Programme:** 2020, Certificate of Completion, Course total simple weighted mean of grades, 90%. National School of Governance.
- **Farm Data Management, Sharing and Services for Agricultural development:** 2019, Certificate of Achievement, Food and Agricultural Organisation of the United Nations.
- **Drought Risk Reduction in integrated Water resources Management Certificate:** 2016, Cap-Net Virtual Campus
- **Geographic Information Systems:** 2015 University of the Free State
- **Water Integrity Training,** 2009 – Integrated Water Resources Management (IWRM) and University of Western Cape
Modules covered: Water governance, Corruption in water sector, Identifying corruption risks, anti-corruption laws, institutions and instruments, Transparency and access to information and accountability, Integrity in integrated water resources management.
- **Higher Diploma in Agricultural Research for Development (ARD),** 2005
University of Wageningen in partnership with Agricultural Research Council.
Case study topic: Peri-urban renewal through Agriculture: Identifying opportunities to alleviate poverty for J.B. Mafora community.
- **Certificate of Merit,** 2002– NIIT Computer Education and Training, Bloemfontein Introduction to Pc's Window 98 & Internet, Microsoft Word 2000, Microsoft Excel 2000, Microsoft Power Point 2000 and Microsoft Outlook (e-mail).

E. Work experience

Position	: Researcher: Natural Resource Management
Institution	: Agricultural research Council (ISCW)
Reporting Line	: Research Team Manager: Agrometeorology
Period	: 1 September 2014 to date

Responsibilities:

- Facilitate and develop agrometeorological and climate change adaptation related research projects and information dissemination for improved decision-making.
- Lead agrometeorological related projects, mentor young scientists in the field of agrometeorology on crop simulation models for the development of tailor-made advisories, climate data and climate change analysis, identify suitable agricultural practices for

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optimisation of agricultural productivity, and conduct field experiments under rain-fed and irrigated conditions.

- Prepare agrometeorological/environmental related proposal, conduct quantitative and qualitative research for agricultural research, training of trainers and farmers on agrometeorological related matters.
- Effective communication and build collaborations with key natural resource sectors, governmental departments, industries and other relevant stakeholders
- Provide sound contribution and strategic direction on agrometeorology and climate adaptation strategies within provinces

Position : Specialist Agrometeorologist: Applications

Institution : South African Weather Service

Reporting Line : Senior Research Manager: Research

Period : 1 September 2013 to 1 September 2014

Responsibilities:

- Run crop simulation models for application product development, climate data analysis, develop suitable products for Agro/Hydro meteorological applications using ACRU Crop Simulation Model and Geographic Information Systems.
- Develop agrometeorological related proposals, interpretation of weather/climate forecast/predictions for agricultural decision-making, development of heat unit forecasting model,
- Interact with other scientist in the development of agrometeorological products for operationalization and commercialisation.
- Contribute in stakeholder engagement and facilitation of research related project for improved decision making
- Effective communication of researched information and dissemination thereof.

Position : Acting Programme Manager

Institution : Agricultural Research Council – Soil Climate and Water

Reporting Line : Research Institute Manager: Natural Resource Management

Period : 01 November 2009 to April 2012

Responsibilities:

- Oversee innovative weather, climate research, remote sensing using observations, monitoring and modelling systems to ensure good quality and usage of weather and climate data,
- Ensure that the system of finance management and internal control established for ARC is carried out within Agro-climatology;
- Be responsible for the effective, efficient, economical and transparent use of financial and other resources within Agro-climatology;
- Take effective and appropriate steps to prevent, within my area of responsibility, any irregular expenditure and fruitless and wasteful expenditure and any under collection of revenue, comply with the provisions of Public Finance Management Act,
- Responsible for the management of the liabilities within the area of my responsibility, Evaluate research publications, management of research within my discipline, project interim and annual reports, prepare proposals within my field of expertise.

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- Engage in negotiations for weather station expansion within the country through ACCESS.
- Supervise the procurement, contracting and operational functions working with technicians, scientist and support staff to ensure deliverables are timely achieved,
- To ensure the extension of innovations for services to all local and international clients. Planning farmers days, farmers workshops and agricultural advisors workshops as part of knowledge dissemination and exchange.
- Conduct in-house training on Automatic Weather Station installation, data logger programming, calibration of instruments and sensors, data quality control measures, and crop modeling

Position	: Researcher: Natural Resource Management
Institution	: Agricultural Research Council – Soil Climate and Water
Reporting Line	: Division Manager: Agrometeorology
Period	: 01 March 2005 to 31 August 2013

Responsibilities:

- Execute agrometeorological related project, programming of data logger, climate data quality control and analysis, crop simulation modelling, application of weather forecast/climate predictions for agrometeorological decision making,
- Generating geographical information maps as part of responsive and adaptive farming,
- Application of agrometeorological information for risk reduction and optimisation of livestock and crop productivity.
- Engage in research proposal development and implementation of such according to international and national standards
- Effective communication of scientific knowledge and information to relevant stakeholders
- Pursue ground research study on weather/climate related information on indigenous information.
- Climate change adaptation strategies for improved agricultural productivity

Position	: Training Manager
Institution	: Dihwai Food and Agricultural services
Reporting Line	: Group Manager: Natural Resource Management
Period	: 01 August 2002 to 31 April 2005

Responsibilities:

- Training of trainers on crop production and livestock husbandry, development of training manual in identified agricultural enterprises,
- Identifying agricultural commodities for income generation and its sustainability,
- Proposal development to source funds for community building projects in the Eastern Free State.
- Effective communication and stakeholder engagement for needs assessment and information dissemination.
- Involved in funding negotiation for community build projects.
- During this period, 120 farmers were trained on a variety of agricultural enterprises and its production, book keeping and developing products for markets

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- Ensure the fulfilment of organisational strategies and adhered to, for the development of subordinates, financial management and the community engagement within the area of operation.
- Overseeing the management and administration within the Training Unit
- Facilitate the development of training manuals and assessment guidelines
- Provide strategic management and leadership in the organisation at large.

Position	: Assistant Researcher / a Tutor / Assistant Lecturer
Institution	: University of the Free State: Agrometeorology / African Languages
Reporting Line	: Supervisor: Natural Resource Management
Period	: 2001 to 2005

Responsibilities:

- Soil sample analysis, soil particle separation, bulk density measurements, soil analysis and packaging,
- weather station operation, climate data retrieval, agrometeorology practical classis, crop simulation modelling, experimental design, biomass data collection, agronomic data analysis, grass type identification and uses.
- Teaching IsiZulu from 1st year to 4th year students

F. Leadership experience

- ARC-NRE Rewards and Recognition Committee, 2021 to date
- ARC-NRE Project Progress Committee Member, 2021 to date
- Free State PPARF and PAREC active committee member/ Chairperson, 2019 to date
- Advisory member for COGTA disaster management focus group 2018 to date
- Free State Agricultural Peer Review Edit Sub-Committee: Chairperson 2017-to date
- Free State Agricultural Research Technical Sub-committee: Member 2017-to date
- External Moderator, Applied and Extension Agrometeorology 2012 to date
- Non-monetary committee ISCW, 2005- 2006

G Current and Past Projects

1. *Project Leader:* Development of Resilient E-farming for agro-climate risk management in African Multi-environments. 2020 Africa-Japan Collaborative Research (“AJ-CORE”) on Environmental Science Joint Proposal Form
2. **2015-2017:** Evaluation of climate change variables on performance of soya beans grown under variable agronomic practices and agro-ecological zones: Implementation of Crop Suitability to Climate Change
3. **2018-2020:** Quantifying Water Use Efficiency of Maize-Soybean Cropping Systems in Semi-Arid Agroecological Zone. National Research foundation
4. **2016-2019:** Seamless Forecasting Of Rainfall and Temperature for Adaptation of Farming Practices to Climate Variability. Water Research Commission.
5. **2014-2015:** Evaluation of climate change variables on performance of soybeans grown under variable agronomic practices and agro-ecological zones. Department of Agriculture Forestry and Fisheries.
6. **2009-2012:** Application of Rainfall Forecasts for Agriculturally Related Decision Making in Modder/Riet and Olifant Catchment, a Water Research Commission Funded Project.

7. **2007-2009:** Assessment of the Social and Economic Acceptability of Rainwater Harvesting and Conservation Practices in Selected Peri-Urban and Rural Communities in Thaba Nchu and Botshabelo area, a Water Research Commission.
8. **2005-2006:** Translation of Soil Classification, land type book to IsiZulu language. Project headed by the ARC-ISCW Pedology Division.
9. **2005-2006:** Tshwane Peri-urban Survey Project. ARC-ISCW Soil and Water Division. Pretoria.
10. **2005-2010:** Databank, evaluation and monitoring of climatic parameters and development of advisories. Quality Control team member
11. **Project Leader:** Application of Rainfall Forecasts for Agriculturally Related Decision Making in Modder/Riet and Olifant Catchment, a Water Research Commission Funded Project.
12. **Team member:** Assessment of the Social and Economic Acceptability of Rainwater Harvesting and Conservation Practices in Selected Peri-Urban and Rural Communities in Thaba Nchu and Botshabelo area, a Water Research Commission funded project.
13. **Translator:** Translation of Soil Classification, land type book to IsiZulu language. Project headed by the ARC-ISCW Pedology Division.
14. **Team member:** Tshwane Peri-urban Survey Project. ARC-ISCW Soil and Water Division. Pretoria.
15. **Quality Control team member:** Databank, evaluation and monitoring of climatic parameters and development of advisories.

H. Association/Professional Bodies

- **Registering as Agricultural Scientist** under category Professional Natural Scientist in terms of section 11 of the Natural Scientific Profession Act, 1993. South African Council of Professional Natural Scientist. Professional Title registering for: Professional Scientist Natural (Pr.Sci.Nat.) **Registration No.** 003417.

I. International Experience

- I have visited several countries and collaborated with international scientists as part of Research and Development Programmes/initiatives. Countries visited include, Zimbabwe, Mozambique, Malawi, Lesotho, Indonesia.
- Progressing collaborations, with the UK and African countries on Forgotten Foods proposal development
- Progressing collaborations, with the Wageningen Research and Innovation University on Global One Health research proposal

J. Keynote Address/ Chair of Session

- **Keynote Speaker:** Free State Society for Agricultural Extension (FSSAE), February 2019. The focus of the discussion was on the significance and the application of agrometeorological services and extension.
- **Speaker:** Free State Agricultural extension Focus meeting, 2013
- **Speaker:** Agrometeorological extension workshop, Sannaspos, 2012
- **Speaker:** Extension Agent Advanced Workshop, University of the Free State, 2009
- **Speaker:** On the use of indigenous knowledge indicators on weather/climate information, National Agrometeorological Committee (NAC) meetings, September 2012. Kimberly, Northern Cape.

K. Publications for Students

- i. **1st to 4th years:** trained 18 University students IsiZulu language and a tutor for 20 Agrometeorology and 5 Soil Science students
- ii. **4th year students:** 26 Crop Science students at Glen College of Agriculture in 2019
- iii. **Honours:** 5 Honours students on Qualitative Research Methodologies module, UFS
- iv. **Honours dissertation**
 - a. Siwaphiwe C. Hlazo Honours Business and Trade at African Leadership University (Rwanda) Titled: Identifying Agricultural Job Opportunities and its impact in selected countries: Rwanda, South Africa. 2021-2022
- v. **Masters dissertation**
 - a. Mr Thivhavhudzi Netshilema, Relationship between production characteristics and breeding soundness of bullocks in central performance testing. Completed, 2021
 - b. Ms M. Motoahae. The impact of climate change on animal production. In progress
- vi. **Philosophiae Doctor:**
 - a. Mr Thivhavhudzi Netshilema, Impact of climate change on choosing optimal breeding season: Perfect feed for reproduction, calving pattern and maximum growth: South Africa, in progress. Supervisor: Dr. NB Nongovhela, Co-Supervisor: Dr G Zuma-Netshiukhwi

M. Dissertation and Thesis Publications

- **Zuma-Netshiukhwi, GNC, 2013.** Titled: The Use of Operational Weather and Climate Information in Farmer Decision Making, Exemplified for the south-western Free State, South Africa. University of the Free State. PhD Dissertation. Supervisor: Prof. C.J. Stigter and Prof. C.C. du Preez.
- **Netshiukhwi, GNC. 2004.** Titled: Photosynthetic Efficiency of Maize and Bean Leaves in the Canopy of Sole and Intercropping Systems under Water. M.Sc. Desertification. University of the Free State. Supervisor: Prof. Sue Walker and Prof JC Grobelaar.

N. Publications in Scientific Journal/Reports/Popular Papers

1. **Zuma-Netshiukhwi G and Walker S, 2022.** Seasonal climate effects on agricultural food systems in the Free State related to ENSO. In progress
2. **Zuma-Netshiukhwi G, 2022.** Evaluation of the Standardized Precipitation Index in Kestel, Eastern Free State, South Africa, *in progress, submitted*
3. Netshilema T, **Zuma-Netshiukhwi G** and Nongovhela NB. Breeding soundness inspection and production features of bullocks under ecological conditions in Free State Region, South Africa. *European Journal of Agriculture and Food Sciences*, 4 (1), 39-46. DOI: 10.24018/ejfood.2022.41.391
4. **Zuma-Netshiukhwi Gugulethu, 2021.** Animal behaviour as indicators for weather forecasting and climate predictions. *Submitted 16 November 2021.*
5. **Zuma-Netshiukhwi, Gugulethu, 2021.** Climate Change a reality or not: Mangaung Metro Municipality experience. *AgriAbout, July Issue 99.*
6. **Zuma-Netshiukhwi, Gugulethu, 2021.** Analysis of Rainfall and Temperature Changes and Variability over Glen Farm, South Africa. *Asian Journal of Advances in Agricultural Research* 16(2): 1-19. DOI: 10.9734/AJAAR/2021/v16i230169
7. **Zuma-Netshiukhwi, G; Hlazo, O.M and Motholo, S.A, 2021.** Evaluating the effect of climate variability on *Zea Mays* productivity over Glen Research Station: South Africa. *European Journal of Agriculture and Food Sciences*, 3 (3), 110-120. DOI: 10.24018/ejfood.2021.3.3.313
8. **Zuma-Netshiukhwi, Gugulethu, 2021.** Interdisciplinary approach the key to climate change adaptation. *Agriorbit Magazines. Agriorbit.com April 2021 Issue.*

9. **Zuma-Netshiukhwi, Gugulethu**, 2021. Weathering the Climate. Climate variability and change- what is the difference? Harvest SA, January/February 2021, Issue 50.
10. **Zuma-Netshiukhwi, Gugulethu**, 2020. The importance of agrometeorological knowledge in agriculture. <https://www.agriorbit.com/the-importance-of-agrometeorological-knowledge-in-agriculture>
11. **Zuma-Netshiukhwi, G** and Mpandeli, S., 2019. The capabilities of Interdisciplinary Approach to Strengthening Farmers' Resilience to Climate Variability and Change. International Journal of Research in Agriculture and Forestry, Volume 6, Issue 6, pp 11-15.
12. **Zuma-Netshiukhwi, G.**, 2018. The Importance of Agrometeorological Services and Extension. Afriland May/June Issue.
13. **Zuma-Netshiukhwi, Gugulethu**, 2017. Use of Operational Weather and Climate Information in Farmer Decision. Lambert Academic Publishing.
14. **Zuma-Netshiukhwi, Gugulethu NC**, Stigter, CJ Kees., and Walker, Sue., 2016. Improving Agricultural Decision Making Using Weather and climate Information for Farmers, south-western Free State, South Africa. *Net Journal of Agricultural Science*, Vol 4:4 pp. 67-77.
15. **Zuma-Netshiukhwi, GNC** and Stigter, CJ., 2016. An Extension Approach to Close the Gap between Suppliers and Users of Agrometeorological Information Services in the South-Western Free State of South Africa. South African Journal of Agricultural Extension, Vol.44, No.2, pages 84-98.
16. **Zuma-Netshiukhwi, GNC; Tsubo, M; Molekwa, S and Chauke, BP.**, 2015. Implementation of Sensitivity of Crop Suitability to Climate Change Soya beans: Evaluation of climate change variables on performance of soybean grown under variable agronomic practices and agro-ecological zones. Report DAFF/ARC 21/1.1.1/4 CCDM-02/ISCW. Department of Agriculture Forestry and Fisheries. Climate Change and Disaster Management.
17. **Zuma-Netshiukhwi, Gugulethu, Stigter, Kees, and Walker, S.**, 2013. Use of Traditional Weather/Climate Knowledge by Farmers in the South-Western Free State of South Africa: Agrometeorological Learning by Scientists. *Journal of Atmosphere* 4 (4):383-410.
18. Kees Stigter, Yunita T. Winarto, Emmanuel Ofori, **Gugulethu Zuma-Netshiukhwi**, Durton Nanja, and Sue Walker., 2013. Extension Agrometeorology as the Answer to Stakeholder Realities: Response Farming and the Consequences of Climate Change. *Journal of Atmosphere* 4:237-253.
19. Walker, S., Bello, Z.A., Beletse, Y.G., Mabhaudhi, T., Modi, A.T. and **Zuma-Netshiukhwi, G.N.C.**, 2013. Calibration of AquaCrop Model to Predict Water Requirements of Traditional African Vegetables. *Acta Horticulturae* 1007, Eds.: K. Hannweg and M. Penter. Proceedings 2nd All Africa Horticulture Congress.
20. Lumsden, T.G. and Schulze, R.E. (Eds), 2012. Development and Applications of Rainfall Forecasts for Agriculturally-Related Decision-Making in Selected Catchments of South Africa. Water Research Commission, Pretoria, RSA, WRC Report TT 538/12. pp 207.
21. **Zuma-Netshiukhwi, GNC & Walker, S.**, 2011. Improving water productivity for the traditional vegetable *Amaranthus Arusha* using AquaCrop. Capacity Development for Farm Management Strategies to Improve Crop-Water Productivity using AquaCrop: Lessons Learned. Knowledge no. 7. UNW-DPC Publication series, pp 63.
22. **Zuma-Netshiukhwi, GNC & Walker S.**, 2010. Potential use of dry spell information for farmer in-season decisions. Proceedings to be published in the *Journal of Physics and Chemistry of the Earth*, in WaterNet/WARF/GWP-SA Symposium held in Zimbabwe 27-29 October 2010.
23. **Zuma-Netshiukhwi GNC & Walker S.**, 2009. Crop-Climate matching for south-western Free State. African Crop Science Conference Proceedings, 9: 39-47.
24. **Zuma-Netshiukhwi, GNC & Beinzonhuit, R.** 2008. Indigenous knowledge on rainfall forecasting. *Farmers Weekly*. April/May Issue, pg 22-23.

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25. Metaxas, L., Thobejane, K., **Netshiukhwi, G.**, Mokgothu, K., Morojele, E. & Mabula, G., 2005. Peri-urban renewal through agriculture: A case study of identifying opportunities to alleviate poverty in JB Mafora, Free State Province, South Africa. ARD report series: # 7. ICRA reports.

N. Services to the scientific community

Since year 2014 to date, I reviewed manuscripts for various scientific journals such as Agricultural Extension, Agronomy, Agrometeorology, Experimental Agriculture, Applied climatology, Environmental Studies.

O. Some Conference/Congress Attendance and Presentation

2010: The 61st International Executive Council Meeting in Indonesia 10-16 October.

2010: The 6th Asian Regional Conference of International Commission on irrigation and Drainage, Yogyakarta, Indonesia, 5-16 October

Combined congress Durban, Badplaas, Cape Town, Rhodes, Pietermaritzburg, Bloemfontein as held on annual basis. Scientific Paper and Posters Presented.

REFERENCES:

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