

## CURRICULUM VITAE

### 1 PERSONAL HISTORY

Siza D. Tumbo, PhD  
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Deputy Permanent Secretary  
Ministry of Agriculture  
From July, 2018 to date

Director General  
Centre for Agricultural Mechanization and Rural Technology  
P.O. Box 764, Arusha – Tanzania  
From March, 2016 to June, 2018

Tutorial Assistant to Professor  
Agricultural Engineering, Modelling and Automation  
Dept. of Agricultural Engineering & Land Planning  
Sokoine University of Agriculture  
From June, 1991 to March, 2018



#### 1.1 Personal Particulars

- Name: SIZA DONALD TUMBO
- Sex: MALE
- Marital status: MARRIED
- Nationality: TANZANIAN

#### 1.2 Academic Qualifications

- B.Sc. Agric. Engineering SUA, Morogoro 1987- 1991
- M.Sc. Engineering UDSM, Dar 1993- 1996
- Ph.D. Agric. Engineering PennState, US 1998- 2001

#### 1.3 Membership in Professional Organisations

- Tanzania Society of Agricultural Engineers
- American Society of Agricultural Engineers
- Gamma Sigma Delta

### 2.0 Research Experience

- 2.1 Smallholder System Innovations: Joint grant proposal development between January and March 2002. Implementation since January 2004 to present. Project title: Development of a GIS-based methodology for adoption of water system innovations. Project partners: Sokoine University of Agriculture, Tanzania; Stockholm University, Sweden; University of Natal, South Africa; International Water Management Institute and Institute of Hydrology and Environment (IHE-UNESCO), Netherlands. (research and extension) (Jan, 2004 – Dec, 2007).
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- 2.2 PARCHED-THIRST (PT) Model: Upgrading and Promotion of PT model. Upgrading involved creating a new user interface, removal of bugs and program modularisation. PT model is agro-hydrological model for simulation of rainwater harvesting and crop growth for maize and rice in semi-arid areas. (research and extension) (Jan, 2002 - Sept, 2005).
  - 2.3 Raising Irrigation Productivity and Releasing Water for Inter-sectoral Needs (RIPARWIN). This is a joint project between University of East Anglia, Sokoine University of Agriculture and International Water Management Institute. Involved in the development of an irrigation impact model for simulation of dry and wet year scenarios based on net and gross irrigation demands over time. (Apr, 2002 – Mar, 2006).
  - 2.4 Managing risk, reducing vulnerability and enhancing agricultural productivity under changing climate. This was a four year project started April 2007 and funded by DFID through IDRC and being implemented in Tanzania, Kenya, Ethiopia and Sudan. I am a member of the research team in Tanzania. 2007/2011.
  - 2.5 Enhancing climate change adaptation in agriculture and water resources in the Great Horn of Africa. This was a four year project started April 2007 and funded by DFID through IDRC and being implemented in Tanzania, Kenya, Ethiopia and Sudan. I am a member of the research team in Tanzania. 2007/2011.
  - 2.6 Integrated Automation of Specialty Crops: Retrofit of the Orchard Sprayer for use with Autonomous Tractor. Funded by USDA. Working on this research as part of my sabbatical leave from July 2009 to June 2010.
  - 2.7 AgWater Solutions Project. This is a project funded by Bill and Melinda Gates Foundation and spearheaded by IWMI, FAO, SEI, IFPRI, IDE and CH2MHILL. Local partners in Tanzania include Sokoine University of Agriculture, University of Dar-es-Salaam and Ministry of Agriculture, Food Security and Cooperatives. It is a 3-year project (2009-2012).
  - 2.8 Impact assessment and livelihood vulnerability and macro-economic modeling studies. This project is funded under the CCIAM (Climate Change Impacts, Adaptation and Mitigation) programme. This is a 3-year project (November 2010 to October 2013).
  - 2.9 Enhancing Climate Change Adaptation in Agriculture and Water resources (ECAW) in the Great Horn of Africa. The project is implemented by four institutions; Sokoine University of Agriculture (Tanzania), Agricultural Research Corporation (Sudan), Ethiopia Institute of Agricultural Research (Ethiopia) and Kenya Agricultural Research Institute (Kenya) and is funded by IDRC-Canada. Project duration is 3 years (October 2011 to September 2014).
  - 2.10 The Role of Mobile Phones towards Improving Coverage of Agricultural Extension Services: A Case Study of Banana and Maize Value Chains. This project is funded under the EPINAV (Enhancing Pro-poor Innovation in Natural Resources and Agricultural Value Chains) programme at Sokoine University of Agriculture. Project duration is 4 years (2011 – 2014).
  - 2.11 Assessing the impacts of climate variability and change on agricultural systems in Eastern Africa while enhancing the region's capacity to undertake integrated assessment of vulnerabilities to future changes in climate as an activity under "The Agricultural Modelling Intercomparison and Improvement Project (AgMIP) in Sub-Saharan Africa and South Asia". This is a two-year project (April 2012- March 2014).
  - 2.12 Water harvesting technologies revisited: Potentials for innovations, improvements and upscaling in sub-Saharan Africa (WHaTeR). Funded by EU under FP7. Consortium budget Euro 2,462,000; SUA 159,328. 3 European Organizations, 5 African.
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- 2.13 Innovating Strategies to safeguard Food Security using Technology and Knowledge Transfer: A people centred approach (Trans-SEC). 2013-2018. Funded by Federal Ministry of Education and Research (BMBF) and Federal Ministry for Economic Cooperation and Development (BMZ), Germany.
- 2.14 Spurring a Transformation for Agriculture through Remote Sensing (STARS). Duration 2014 – 16. USD 251,447. Funded by Bill and Melinda Gates Foundation. Implemented in East Africa, West Africa and Bangladesh. SUA working with University of Maryland.
- 2.15 Adapting East African smallholder systems to climate change and variability through a stakeholder driven, multi-modelling integrated assessment approach (AgMIP-2). 2015-2017. Source of funds: Columbia University and NASA/GISS, in partnership with DFID.

### **3.0 Consultancies**

- 3.1 Rapid Appraisal of Policies and Institutional Frameworks for Agricultural Water Management in Tanzania. IMAWESA. May – September, 2006.
  - 3.2 Resource Person - Training on the Development of Decision Support Tools in Soil, Nutrient and Water Management. Nairobi. ASARECA. May 2007.
  - 3.3 Resource Person – Short courses on Soil-Plant-Water Relationships for Efficient Water Use for Professional Skills Improvement in Land and Water Management. SADC Land & Water Management Applied Research and Training Programme. April/May 2008.
  - 3.4 Economics of Climate Change for Agriculture Sector in Tanzania Adaptation Options and their Costs. SEI/DFID. December, 2010. <http://economics-of-cc-in-tanzania.org/reportsandpublications.html>.
  - 3.5 Investments in Agricultural Water Management with greatest potential to improve incomes and food security. International Water Management Institute, Accra, Ghana. December, 2010 to March, 2011.
  - 3.6 Costing and planning of agriculture's adaptation to climate change. International Institute for Environment and Development. Jan – April, 2011.
  - 3.7 Climate change and agriculture action plan cost estimates and targeting strategy. World Bank, Tanzania. November 2013 - February 2014.
  - 3.8 Assessment of Tanzania's Agricultural Production, Climate Change, Agricultural Trade and Food Security. Kenya Institute for Public Policy Research and Analysis (KIPPRA), Kenya. August to December, 2014.
  - 3.9 Cost-Benefit Analysis (CBA) on Water Use Efficiency and Water Storage Technologies in Tanzania. Ministry of Agriculture, Food Security and Cooperatives (MAFC), Tanzania. December 2014 to March, 2015.
  - 3.10 Innovation Laboratory for Small Scale Irrigation (ILSSI): Tanzania. Client – International Water Management Institute. 2014-2018.
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## 4.0 PUBLICATIONS

### 4.1 Selected Journal Articles

- 4.1.1 Tumbo, S. D., Mwano, M. J., Mpeti, E. and N. I. Kihupi. 2010. Skill and Usefulness of Regional Seasonal Forecasts for Adoption to Climate Change for Agricultural Production in Tanzania. *Journal of the Geographical Association of Tanzania*. Vol. 36.
  - 4.1.2 Tumbo, S.D., FC Kahimba, BP Mbilinyi, FB Rwehumbiza, HF Mahoo, WB Mbungu, E Enfors. 2012. Impact of projected climate change on agricultural production in semi-arid areas of Tanzania: A case of Same district. *African Crop Science Journal*, 20 (2), 453-463.
  - 4.1.3 Ayubu J Churi, Malongo RS Mlozi, Siza D Tumbo, Respickius Casmir. 2012. Understanding Farmers Information Communication Strategies for Managing Climate Risks in Rural Semi-Arid Areas, Tanzania. *International Journal of Information*, 2 (11), 838-845.
  - 4.1.4 Sanga, C., Tumbo, S.D., Mlozi, M., & Kilima, F. (2013) Stakeholders' Analysis using Value Chain Analysis: AHP in action. *International Journal of Interdisciplinary Studies on Information Technology and Business (ISITB)*, Volume 1, Issue 2, Pages 85 – 104
  - 4.1.5 Tumbo, S.D., Mutabazi, K. D., Masuki, K. F. G., Rwehumbiza, F. B., Mahoo, H. F., Nindi, S. J. and J. G. Mowo. (2013) Social Capital and Diffusion of Water System Innovations in the Makanya Watershed, Tanzania. *The Journal of Socio-Economics*. 43: 24-36.
  - 4.1.6 Sanga, C., Mlozi, M. R. S., Tumbo, S.D., Mussa, M., Shetto, M. C. R., Mwamkinga, G. H., & Haug, R. (2013). On Search for Strategies to Increase the Coverage of Agricultural Extension Service: Web-based Farmers' Advisory Information System. *International Journal of Computing & ICT Research*, 7(1).pp. 42-55
  - 4.1.7 Churi, A. J., Mlozi, M. R., Mahoo, H., Tumbo, S. D., & Casmir, R. (2013). A Decision Support System for Enhancing Crop Productivity of Smallholder Farmers in Semi-Arid Agriculture. *International Journal of Information*, 3(8).
  - 4.1.8 Churi, A. J., Mlozi, M. R., Tumbo, S. D., & Casmir, R. (2013). Sources and Channels of Agricultural information to smallholder farmers in Same district of Tanzania, *International Journal of Agricultural Sciences*, 2(5).
  - 4.1.9 Mourice, S. K., Tumbo, S. D., Amuri, N., and Rweyemamu, C. L. 2014. Modeling potential rain-fed maize productivity and yield gaps in the Wami River sub-basin, Tanzania. *Acta Agriculturae Scandinavica, Section B – Soil & Plant Science*, DOI: 10.1080/09064710.2014.976252.
  - 4.1.10 Admasu, H., Mahoo, H. F. Rwehumbiza, F. B. R., Tumbo, S. D. and Mogaka, H. 2014. Enhancing response farming for strategic and tactical management of risks and seasonal rainfall variability. *African Crop Science Journal*, Vol. 22, Issue Supplement s4, pp. 941-950.
  - 4.1.11 Mourice, S. K., Rweyemamu, C. L., Tumbo, S. D. and Amuri, N. 2014. Maize cultivar specific parameters for Decision Support System for Agrotechnology Transfer (DSSAT) application in Tanzania. *American Journal of Plant Sciences*, 5, 821-833. <http://dx.doi.org/10.4236/ajps.2014.56096>.
  - 4.1.12 Sanga, C., Musa, M., Tumbo, S., Mlozi, M. R. S., Muniche, L., and R. Haug. 2014. On the development of the mobile based agricultural extension system in Tanzania: A
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technological perspective. *International Journal of Computing and ICT Research*. Vol. 8, Issue 1, 49 – 67.

- 4.1.13 Masuki, K., Mutabazi, K., Mattee, A., Tumbo, S., Rwehumbiza, F. and J. Mowo. 2014. Factors influencing intensity of adoption in integrated water management innovations in the semi-arid areas of north-eastern Tanzania. *International Journal of Environmental Engineering and Natural Resources*. Vol. 1, Issue 5. 227-234.
- 4.1.14 Mnimbo, T. S., Mbwambo, J., Kahimba, F. C. and Tumbo, S. D. 2015. A gendered analysis of perception and vulnerability to climate change among smallholder farmers: the case of Same District, Tanzania *Climate and Development*. DOI: 10.1080/17565529.2015.1005038.
- 4.1.15 Kiobia, D. O., Tumbo, S. D., Cantillo, J., Rohde, B. B., Mallikarjunan, P. K. and R. W. Mankin. 2015. Characterization of sounds in maize produced by internally feeding insects: investigations to develop inexpensive devices for detection of *Prostephanus truncatus* (Coleoptera: Bostrichidae) and *Sitophilus zeamais* (Coleoptera: Curculionidae) in small-scale storage facilities in sub-Saharan Africa. *Florida Entomologist*. Vol. 98 No. 2. 405-409.

#### 4.2 Selected Proceedings/Conference Papers

- 4.2.1 Tumbo, S.D., Kahimba, F.C., Mbilinyi, B.P., Rwehumbiza, F.B., Mahoo, H.F., Mbungu, W. 2010. Adequacy of the current agronomic management strategies to cope with climate change: The case of Same District in Tanzania. In Proc. 11th WaterNet/WAFSA/GWP-SA Symposium 2010 IWRM for National and Regional Integration: Where Science, Policy and Practice Meet, 27-29 October 2010, Victoria Falls, Zimbabwe.
- 4.2.2 Tumbo, S.D., Rwehumbiza, F.B., Kahimba, F.C., Enfors, E., Mahoo, H.F., Mbilinyi, B.P., Mkoga, Z., and Churi, A. 2010. Agronomic Management Strategies for Adaptation to the Current Climate Variability: The Case of North-Eastern Tanzania. In Proc. 2nd International Conference: Climate, Sustainability and Development in Semi-arid Regions. August 16-20, 2010. Fortaleza – Ceará, Brazil. <http://www.dewpoint.org.uk/article.aspx?ArticleID=1203>.
- 4.2.3 Admassu, H., Rwehumbiza, F. B., Mahoo, H.F, and Tumbo, S. 2010. The Role of Response Farming Rainfall Forecasts in improving the performance of Agronomic Adaptation Strategies. In Proc. 2nd International Conference: Climate, Sustainability and Development in Semi-arid Regions. August 16-20, 2010. Fortaleza – Ceará, Brazil. <http://www.dewpoint.org.uk/article.aspx?ArticleID=1203>.
- 4.2.4 Tumbo, S. D., Mwanjo, M. J. and N. I. Kihupi. 2008. Forecasting Seasonal Rainfall Using Artificial Neural Networks. 3rd Annual National Science, Technology and Innovation Conference and Exhibition. 5th -7th November 2008. AICC, Arusha, Tanzania.
- 4.2.5 Tumbo, S. D., Mwanjo, M. J., Mpeti, E. and N. I. Kihupi. 2008. Skill and Usefulness of Regional Seasonal Forecasts for Adaptation to Climate Change for Agricultural Production in Tanzania. 3rd Annual National Science, Technology and Innovation Conference and Exhibition. 5th -7th November 2008. AICC, Arusha, Tanzania.
- 4.2.6 Sanga, C., Sumari, N., Tumbo, S. D. 2013. On the Development of Climate Data Visualization tool for Interpretation of Empirical Results from Climate Model: Does it add Value to Different Stakeholders?, Proceedings of the 6th UbuntuNet Alliance annual Conference, 213-226.
- 4.2.7 Wambura, F., Tumbo, S., Ngongolo, H. Mlonganile, P., and Sangalugembe, C. 2014. Tanzania CMIP5 Climate Change Projections. Proceedings of the International Conference
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- on Reducing Climate Change Challenges through Forestry and Other Land Use Practices. Nashera Hotel, Morogoro, Tanzania. 1<sup>st</sup> – 3<sup>rd</sup> April 2014. 46 – 63.
- 4.2.8 Swai, E., Mutabazi, K.D., Tumbo, S., Urassa, N., Mwinuka, L., Machau, D., Graef, F., and Herrmann, L. Farmer's perception on soil fertility status and soil fertility management in semi-arid areas of Central Tanzania. Tropentag 2015 - International Conference on Research on Food Security, Natural Resource Management and Rural Development. Management of land use systems for enhanced food security – conflicts controversies and resolutions. 16-18 September, 2015. Humboldt-Universität zu Berlin, Berlin, Germany. Book of abstracts. Pg 124.
- 4.2.9 Graef, F., Sieber, S., Mutabazi, K. D., and Tumbo, S. 2015. Trans-SEC – Innovating strategies to safeguard food security using technology and knowledge transfer – current status. Tropentag 2015 - International Conference on Research on Food Security, Natural Resource Management and Rural Development. Management of land use systems for enhanced food security – conflicts controversies and resolutions. 16-18 September, 2015. Humboldt-Universität zu Berlin, Berlin, Germany. Book of abstracts. Pg 349.
- 4.2.10 Dempewolf, J., Nakalembe, C., Becker-Reshef, I., Nagol, J., Tumbo, S., Maurice, S., Adusei, B., Hansen, M., Mbilinyi, B., Ntikha, O. A., and Kongo, V. 2015. Agricultural monitoring for food security in smallholder farming systems. Tropentag 2015 - International Conference on Research on Food Security, Natural Resource Management and Rural Development. Management of land use systems for enhanced food security – conflicts controversies and resolutions. 16-18 September, 2015. Humboldt-Universität zu Berlin, Berlin, Germany. Book of abstracts. Pg 392.
- 4.2.11 Mnimbo, T., Lyimo-Macha, J., Urassa, J., Mahoo, H., and Tumbo, S. 2015. Gender roles, choices of crop types and value chain upgrading strategies in semi-arid and sub-humid Tanzania. Tropentag 2015 - International Conference on Research on Food Security, Natural Resource Management and Rural Development. Management of land use systems for enhanced food security – conflicts controversies and resolutions. 16-18 September, 2015. Humboldt-Universität zu Berlin, Berlin, Germany. Book of abstracts. Pg 433.
- 4.2.12 Kaingo, J., Tumbo, S., Ludger, H., and Mbilinyi, B. 2015. Participatory soils mapping in a semi-humid agricultural landscape in Tanzania. Tropentag 2015 - International Conference on Research on Food Security, Natural Resource Management and Rural Development. Management of land use systems for enhanced food security – conflicts controversies and resolutions. 16-18 September, 2015. Humboldt-Universität zu Berlin, Berlin, Germany. Book of abstracts. Pg 433.
- 4.2.13 Yustas, Y., Silayo, V. and Tumbo, S. 2015. Investigation of anaerobic digestion backed by solar-wind system for clean energies in rural areas. Tropentag 2015 - International Conference on Research on Food Security, Natural Resource Management and Rural Development. Management of land use systems for enhanced food security – conflicts controversies and resolutions. 16-18 September, 2015. Humboldt-Universität zu Berlin, Berlin, Germany. Book of abstracts. Pg 433.
- 4.3 **Books/Book chapters**
- 4.3.1 Lankford, B. A., **Tumbo, S.** and K. Rajabu. 2009. Water competition, variability and river basin governance: A critical analysis of the Great Ruaha River, Tanzania. In Molle, F. and P. Wester (Eds.), River basin trajectories: Societies, environments and development. CABI Publishing, pp. 171-195.
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- 4.3.2 Henry Mahoo, Frederick Kahimba, Khamaldin Mutabazi, Siza Tumbo, Filbert Rwehumbiza, Paul Reuben, Boniface Mbilinyi and John Gowing. 2013. Bright spots and barriers to adoption. In: Critchley, W. and Gowing, J. (Eds). Water Harvesting in Sub-Saharan Africa. Chapter 8. Earthscan, 118-133 pp.
- 4.3.3 Kilembe, C., Thomas, T. S., Waithaka, M., Kyotalimye, M. and S. Tumbo. 2013. East Africa Agriculture and Climate: A comprehensive Analysis – Tanzania. (eds) Waithaka, M., Nelson., G. C., Timothy, T.S. and M. Kyotalinye. Chapter 11: 3-34b.
- 4.3.4 Sanga, C. A., Tumbo, S. D., & Mlozi, M. R. 2014. System Design and ICT Adoption in Agricultural Extension Services Delivery in Tanzania. In K. Bwalya (Ed.), Technology Development and Platform Enhancements for Successful Global E-Government Design (pp. 282-306). Hershey, PA: Information Science Reference. doi:10.4018/978-1-4666-4900-2.ch015.
- 4.3.5 Mbungu, W. B., Mahoo, H. F., Tumbo, S. D., Kahimba, F. C., Rwehumbiza, F. B., and B. P. Mbilinyi. 2015. Using climate and crop simulation models for assessing climate change impacts on agronomic practices and productivity. Sustainable Intensification to Advance Food Security and Enhance Climate Resilience in Africa. Eds. Lal, R., Singh, B. R., Mwaseba, D. L., Kraybill, D., Hansen, D. O., Lars, O. E. pp 201-219.

Signature \_\_\_\_\_

Date: **December, 2021**