

Going back to our roots to combat climate-linked disasters – the journey across the ITIKI Bridge

By Muthoni Masinde

In order to effectively address climate-related challenges, it is crucial to incorporate elements of the status quo, cultural transfers, and mutual learning – “going back to the roots”, so to say. This is particularly true for Africa's small-scale farmers, who can benefit from the integration of indigenous knowledge (IK) on weather and climate. While IK alone may not offer a comprehensive solution, integrating it with conventional scientific approaches is imperative. To address this need, I developed the ITIKI Bridge as a means of bridging these two worlds.

ITIKI, an acronym for Information Technology and Indigenous Knowledge with Intelligence, is a comprehensive system that combines artificial intelligence algorithms, weather sensors, and a mobile application. Its purpose is to merge weather data with the traditional wisdom of African farmers, enabling the prediction of droughts. Drawing inspiration from the concept of an 'indigenous bridge' known as "itiki" in my local language, I envisioned the integration of IK-based drought forecasting systems with seasonal climate forecasts. In the past, itiki bridges were constructed by local experts who possessed extensive knowledge of river terrain and the strength of different trees to withstand the weight. The remarkable accuracy of itiki bridges was exemplified during the 1992 floods in Kenya, where a newly built modern bridge was swept away while a nearby itiki bridge remained intact (I personally witnessed this event).



Through the ITIKI app or SMS messages, farmers receive drought forecasts. The forecasts are also accessible through a web portal, emails, and audio files. Young individuals (especially women) in farming communities gather valuable information about animal behaviour, local vegetation, and flowering trees, capturing their findings on the ITIKI app. This data is then combined with information from local weather stations to model weather patterns months in advance. Farmers can subscribe to this service for a nominal fee and receive regular updates in their local

language, empowering them to make informed decisions about crop selection and whether to sell or save their produce.

The journey of ITIKI, from its initial concept to its current widespread implementation, clearly highlights its ability to bridge the gap between traditional knowledge and technological advancements. Although it faced challenges in terms of funding and initial deployment, ITIKI has successfully overcome these obstacles and achieved remarkable growth and impact, showcasing its resilience and ability to survive the "innovation valley of death". By integrating indigenous knowledge with state-of-the-art artificial intelligence, ITIKI not only enhances its credibility but also emerges as a transformative solution for addressing climate-related challenges and supporting the livelihoods of small-scale farmers in Africa. Thus, it aligns with the Africa Union's slogan of "African Solutions to Africa's problems" by emphasizing the importance of reconnecting with our roots.

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1. Publications

PhD Thesis

[thesis_sci_2012_masinde_m.pdf](#),
https://open.uct.ac.za/bitstream/11427/6891/1/thesis_sci_2012_masinde_m.pdf

2. In the news

2.1 CUT

2019, July 19, [CUT Professor develops APP that may bring a solution to drought challenges in Africa](#), 2019 July 19.pdf, <https://www.cut.ac.za/news/cut-professor-develops-app-tool-that-may-brin>

2021 Feb 18, [Prof. Muthoni Masinde presents to Scifest Africa on application of Design Thinking in the creation of ITIKI tool](#), 2021 February 18,
<https://www.cut.ac.za/news/prof-muthoni-masinde-presents-to-scifest-afri>

2019, March 29, [CUT professor to present at World Bank Water Week in Washington, DC](#), 2019 March 29.pdf, <https://www.cut.ac.za/news/cut-professor-to-present-at-world-bank-water>

2016, Aug 17, [Top researcher at CUT wins big at Women in Science Awards](#), 2016 August 17.pdf, <https://www.cut.ac.za/news/top-researcher-at-cut-wins-big-at-women-in-sc>

2016, Aug, 29, [CUT, Nebraska-Lincoln University launch partnership](#), 2016 August 29 B.pdf, <https://www.cut.ac.za/news/cut-nebraska-lincoln-university-launch-partne>

2016, Nov 01, [CUT acknowledge excellence 2016](#), 2016 November 01.pdf, <https://www.cut.ac.za/news/cut-acknowledge-excellence>

2015, Nov 01, [CUT acknowledge excellence 2015](#), 2015 November 01.pdf, <https://www.cut.ac.za/news/cut-recognise-excellence>

2.2 Local Media Coverage

2016, Aug 16, Radio station Radio 702, <https://brandsouthafrica.com/58262/drought-predicting-tool/>
<https://soundcloud.com/primediabroadcasting/dr-muthoni-masinde-walked-gets-top-honours-in-women-in-science-award>

2016, Aug 26, SABC Expresso Show, <https://www.youtube.com/watch?v=d-Gh9rh8XIQ>

2019, April 03, News24
[Prof's tool on global stage News24.pdf](#), <https://www.news24.com/news24/profs-tool-on-global-stage-20190402>

2.3 International Media

2016, Aug 16, Built in Africa, [Built in Africa.pdf](#), <https://www.builtinafrica.io/videos/itiki-drought-prediction>

2016, Sept 26, Reuters, [Crickets and birds](#), <https://www.reuters.com/article/uk-africa-rainfall-tech-idUKKCN11W0X4>

2020, Mar 29, CNN, [An app prepares farmers for drought](#),
<https://edition.cnn.com/2020/05/29/business/itiki-drought-app-spc-intl/index.html>

3. Securing Water for Food

Pivoting to Survive in South Africa: An Unusual Innovation Finds A Way, [Pivoting to Survive in South Africa.pdf](#), <https://securingwaterforfood.org/innovator-news/pivoting-to-survive-in-south-africa>

SWFF Innovator Muthoni Masinde Featured in Series "When Women Do Better, Countries Do Better",
[When Women Do Better Countries Do Better.pdf](#), <https://securingwaterforfood.org/innovator-news/swff-innovator-muthoni-masinde-featured-women-better-countries-better>

Distinguished Young Women Researchers: Dr. Muthoni Masinde, [Distinguished Young Women Researchers Dr. Muthoni Masinde - SWFF.pdf](#), <https://securingwaterforfood.org/innovator-news/distinguished-women-science>

Weather Forecasting: A Critical Element in the Planet's Future, [Weather Forecasting A Critical Element in the Planet's Future.pdf](#), <https://securingwaterforfood.org/innovator-news/weather-forecasting-planets-future>

Incorporating Ants, Animals, and Technology for Accurate Drought Prediction, [Incorporating Ants, Animals, and Tech for Accurate Drought Prediction.pdf](#),
<https://securingwaterforfood.org/innovator-news/incorporating-ants-animals-technology-accurate-drought-prediction>

Nurturing My Corner of the World: How Indigenous Knowledge Combats Drought, [Dr. Muthoni Masinde on How Indigenous Knowledge Combats Drought.pdf](#),
<https://securingwaterforfood.org/innovator-news/muthoni-masinde-indigenous-knowledge>

Dragonfly Forecasts Rain? To See Is to Believe, [Dragonfly Forecasts Rain To See Is to Believe.pdf](#),
<https://securingwaterforfood.org/innovator-news/dragonfly-forecasts-rain-to-see-is-to-believe>

Drought Prediction Tool – CUT, Free State, [Drought Prediction Tool - CUT.pdf](#),
<https://securingwaterforfood.org/innovators/drought-prediction-tool>

The Database That's Fighting Drought, [The Database That's Fighting Drought.pdf](#),
<https://securingwaterforfood.org/innovator-news/database-thats-fighting-drought>

4. Keynote Speeches

2021, August 31, CUT STEM Academy celebrates Charlotte Maxeke with women-focused lecture, [Charlotte Maxeke with women-focused lecture.pdf](#), <https://www.cut.ac.za/news/cut-stem-academy-celebrates-charlotte-maxeke>

2022, Aug 24, Microsoft Africa Research Institute (MARI), [Muthoni-Masinde-malaria-prediction-Presentation.pdf](#), <https://www.youtube.com/watch?v=tn2v7Xg3SZo>

2020, Sept 2020, University College Dublin, School of Computer Science: Zoom for thought, , <https://www.ucd.ie/discovery/zoomforthought/returningtoourrootstocombatacrisis.html>; <https://www.youtube.com/watch?v=wnzGWTRAXKM>; , Scifest Africa on application of Design Thinking in the creation of ITIKI tool; , [ITIKI - Scifest Africa.pdf](#), <https://www.youtube.com/watch?v=ok6e3UPvmNo&t=121s>

2022, June 28, Inaugural Meru University of Science and Technology International Conference, [MUST IC 2022.pdf](#), <https://journals.must.ac.ke/index.php/AJSTSS/issue/view/1>;
<https://youtu.be/NeXjwndk3ZY>

2022, Sept 08, UNESCO hosts the Southern Africa sub-Regional Forum on Artificial Intelligence; , [UNESCO Southern Africa sub-Regional Forum on Artificial Intelligence.pdf](#),
<https://sarfa2022.org/#/videos>

2019, Oct 10, CUT, FEBIT Research Seminar, <https://youtu.be/UusObxHUFzg>

2019, Apr 02, 2019 World Bank Water Week, [World Water Week.jpg](#),
<https://programme.worldwaterweek.org/Content/ProposalResources/PDF/2018/pdf-2018-8071-7-Session%203.6%20Muthoni%20Masinde.pdf>

5. ITIKI Documentary

5.1 [1 Minute](#)

5.2 [5 Minute](#)

5.3 [30 Minutes](#)

5.4 [ITIKI Promo Video from Pictures](#)