

FALSE START, SADNESS, AND FINALLY HAPPINESS TATENDA DALU

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I am an Iso Lomso Fellow at the Stellenbosch Institute for Advanced Study (STIAS), South Africa. Iso Lomso means "the eye of tomorrow" in the isiXhosa language in South Africa. The programme aims at African scholars who have obtained a doctoral degree within the preceding seven years, have completed at least one year of postdoctoral fellowship, and hold an academic position at a university or research institution anywhere in Africa. As part of the fellowship, I was supposed to go for an international placement for at most three months. When I was told that I would be going to Wiko Berlin, I was both excited and nervous. I was excited because I was looking forward to visiting Germany for the first time and meeting Fellows from different parts of the world, and I was nervous due to the language differences, but that did not really affect the enthusiasm that I had about the anticipated visit.

I arrived in Berlin on the 22nd of September 2021 from Nelspruit, South Africa, after at least two false starts due to the COVID pandemic, as the German Consulate was not processing visas. All these obstacles resulted in my family not travelling with me when the consulate finally opened, as they had to create a space for me during the next academic year. However, against all these odds and thanks to continuous support and encouragement from the Wiko staff, I managed to get to Berlin only three weeks after the start of the new academic year. During my short 2.5-month fellowship, I was physically alone in Berlin and my Co-Fellows, staff, and German research collaborators became my family. Thank you to Jana and her family for taking me in as part of their family; I really appreciate all the love they showed me and thoroughly enjoyed visiting all the places they took me to in Berlin and the surrounding areas, and I am very looking forward to seeing them soon in South Africa or Germany. I will always remember the love shown by the various Fellows. Mark, Rachel, and I toured Leipzig together, and Szabolcs and I shared countless walks and dinners. I went for several trips and events with the young Fellows Szabolcs, Rachel, Kulbhushansingh, and Elisa and relished incredible lunch dates with Sanyu. Thank you, Hannah, for giving us €20, after we went to dinner only to realise that the restaurant accepted only cash and we had go around knocking on all Fellows' doors so that we could go back and pay the restaurant at the train station! Thanks to Dunia and the team for amazing lunches and dinners. All the love, smiles, and care shown in sometimes grand and often subtle ways by the several Fellows and staff – I really appreciate it.

My time at Wiko was stimulating and interesting, especially during the weekly colloquia when we sat down and listened to the main talk, followed by spirited debate as the topping on a delicious cake. People from disparate fields nonetheless presented their talks in such a way that even a layman could follow and understand. This interactive platform

provided me with opportunity to mingle with other scholars and Fellows from different epistemological backgrounds and cultures, giving me a good glimpse into their work and what inspired it.

During my two and a half months at Wiko, I worked on data capturing and manuscript writing for my main project on freshwater crabs in the Eastern Highlands of Zimbabwe and other projects from southern Africa. During the presentation of my project, I received valuable feedback on how to significantly improve the project. I also captured all the data from my previous fieldwork, have now started to analyse it, and will be writing a manuscript on the preliminary findings. I believe that my time was well spent, as I managed to write and submit 13 journal articles (see below: refs. 1–13). I lead all the papers as first or senior author, and some of the work involved the students and collaborators from my research group back home and abroad; all the papers note the Wiko affiliation.

The first paper from my Eastern Highlands project that has been published looked at macroinvertebrate and diatom communities in relation to land use patterns (ref. 1). As you know, anthropogenic activities have increasingly subjected freshwater ecosystems globally to various pressures. Increasing land use activities have been strongly linked to deteriorating freshwater ecosystems and dwindling biodiversity. Hence, to implement sound management and conservation policies, relations between land use and environmental and biotic components need to be widely documented. Thus, we evaluated the impacts of land use on biotic components by assessing the diatom and macroinvertebrate community composition in Eastern Highlands (Zimbabwe) streams to investigate the main spatial diatom and macroinvertebrate community variances and how environmental variables and spatial factors influence community composition. We found that land use had a significant effect on water quality, with variables that differed significantly depending on the environment type, i.e. plantations, national parks, and communal areas, across 49 study localities. The second paper that I wrote assessed organic matter dynamics in the Rasmar-declared wetland system in South Africa; what we observed was that organic matter tended to differ with wetland zones and seasons and was strongly related to the autochthonous and allochthonous inputs (ref. 2). This paper was strongly linked to another investigation of macroinvertebrate diversity we conducted in the same study area, where functional feeding group (FFG) ratios indicated that all sites were strongly autotrophic, had high predator-prey ratios, few shredders, and a stable substrate across seasons (ref. 3). The wetlands are a protected area, so we found that information on macroinvertebrate and organic matter dynamics could provide a useful baseline for further studies of wetlands in the region subject to greater anthropogenic stresses, as well as future studies in this Ramsar site. Most of the papers were on environmental monitoring and assessment across different river, reservoir, and wetland localities in South Africa (refs. 4–13); one paper assessed community structure in wetland systems (ref. 4) and another two assessed human perceptions of the presence of large wood in river systems (ref. 6) and green space utilisation (ref. 7).

My Iso Lomso Fellowship at Wiko reaffirmed my conviction that it is worth continuing to develop a scientific career in Africa, working with many collaborators from around the world. Despite the constant challenges posed by limited resources and lack of funds, our work continues to make a difference, as highlighted by several breakthroughs we made during the COVID pandemic, in which the earlier detection and sequencing were done in Africa, and we need to continue training a next generation of scientists to fill the vacuum that is currently being left in the region. I firmly believe that developing a well-connected local scientific community is important and I applaud Wiko for partnering with STIAS, as this will help increase the continent's general welfare and tackle issues of inequality. Through this collaborative process that brought me to Wiko, I believe the institution is playing an important role in increasing the representation of African Fellows who are based on the mother continent and increasing the proportion of Global South Fellows.

I strongly believe I achieved as much academically as I wanted; my stay at Wiko was a much-needed break in life, particularly a temporary escape from strict COVID lock-downs in South Africa. Going back home came early, bringing my exciting fellowship break to a complete stop, but I dearly missed my family. However, I am sure that my collaborations and links to this unique place and to my new friends from Germany and all over the world will last forever. Finally, to top it all, the support and service I received from the Wiko team led by the Rector Prof. Barbara Stollberg-Rilinger was amazing. They made this a home away from home and fully gave me space to do my own work.

Reference list for papers submitted and published during my Iso Lomso Fellowship at the Wissenschaftskolleg

## Corresponding author \*

1. **Dalu, T.\***, T. Mwedzi, R. J. Wasserman, T. C. Madzivanzira, T. Nhiwatiwa, and R. N. Cuthbert (2022). "Land use effects on water quality, habitat, and macroinvertebrate

- and diatom communities in African highland streams." *Science of the Total Environment* 846: 157346. doi:10.1016/j.scitotenv.2022.157346. Impact Factor (IF) = 10.75 (Q1).
- Dalu, T.\*, R. N. Cuthbert, L. Makhuvha, F. Dondofema, and R. J. Wasserman (2022).
  "Assessing variation in below-ground organic matter dynamics in the Ramsar-declared Nylsvley Wetland system, South Africa." *Chemistry and Ecology*. doi: 10.1080/02757540.2022.2100361. IF = 2.24 (Q2).
- 3. **Dalu, T.\***, R. N. Cuthbert, M. J. Methi., F. Dondofema, L. D. Chari, and R. J. Wasserman (2022). "Drivers of aquatic macroinvertebrate communities in a Ramsar declared wetland system." *Science of the Total Environment* 818: 151683. IF = 10.75 (Q1).
- 4. **Dalu, T.\***, R. N. Cuthbert, and R. J. Wasserman (2022). "Limited plankton community shifts over winter inundation events in Austral temporary wetlands." *Chemistry and Ecology* 38 (6): 586–601. IF = 2.24 (Q2).
- 5. **Dalu, T.\***, R. N. Cuthbert, S. Moyo, R. J. Wasserman, L. D. Chari, O. L. F. Weyl, and M. C. Jackson (2022). "Invasive carp alter trophic niches of consumers and basal resources in African reservoirs." *Science of the Total Environment* 813: 152625. IF = 10.75 (Q1).
- Dalu, T.\*, R. N. Cuthbert\*, O. L. F Weyl, and R. J. Wasserman (2022). "Community structure and environmental factors affecting diatom abundance and diversity in a Mediterranean climate river system." Science of the Total Environment 810: 152366. IF = 10.75 (O1).
- Dalu, M. T. B., R. N. Cuthbert, P. Ragimana, A. W. Gunter, F. Dondofema, and T. Dalu\* (2022). "Assessing human perceptions towards large wood in river ecosystems following flooding experiences." *River Research and Applications* 38 (7): 1296–1304. IF = 2.44 (Q2).
- 8. Dalu, M. T. B., A. W. Gunter, K. W. Masasane, and **T. Dalu\***. "Understanding factors and perceptions affecting urban green space utilisation in two small towns in the Limpopo Province, South Africa." *Cities*. Under review. IF = 6.08 (Q1).
- 9. Mpakairi, K. S.\*, T. Dube, F. Dondofema, and **T. Dalu** (2022). "Spatio-temporal variation of vegetation heterogeneity in groundwater dependent ecosystems within arid environments." *Ecological Informatics* 69: 101667. IF = 4.50 (Q1).
- Mutshekwa, T.\*, R. N. Cuthbert, L. Mugwedi, R. J. Wasserman, F. Dondofema, and T. Dalu\* (2022). "Behavioural responses and mortality of Mozambique tilapia Oreochromis mossambicus to three commonly used macadamia plantation pesticides." Water 14 (8): 1257. IF = 3.53 (Q1).

- 11. Netshituni, V. T., R. N. Cuthbert, F. Dondofema, and **T. Dalu\*** (2022). "Effects of wildfire ash from native and alien plants on phytoplankton biomass." *Science of the Total Environment* 834: 155265. IF = 10.75 (Q1).
- Makherana, F., R. N. Cuthbert, C. J. Monaco, F. Dondofema, R. J. Wasserman, G. M. Chauke, L. F. Munyai, and T. Dalu\* (2022). "Informing spread predictions of two alien snails using movement traits." *Science of the Total Environment* 811: 152364. IF = 10.75 (Q1).
- 13. Munyai, L. F., **T. Dalu\***, R. J. Wasserman, L. Mugwedi, F. Dondofema, G. O'Brien, and R. N. Cuthbert (2022). "Functional responses and additive multiple predator effects of two common wetland fish." *Water* 14 (5): 699. IF = 3.53 (Q1), Unit = 0.14.