# Remote Sensing Applications for Schistosomiasis

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## INTRODUCTION

SCHISTOSOMIASIS AND REMOTE SENSING

- Neglected tropical disease affecting over 150 million people and is transmitted via freshwater snails
- Surveillance of snail habitats is critical for targeted disease control
- Remote sensing provides large-scale, repeatable monitoring of ecological conditions linked to transmission

ENVIRONMENTAL INDICES

**NDVI: Normalised Difference Vegetation Index**
**NDWI: Normalised Difference Water Index**

- Indicators of environmental conditions that may support snail presence or shedding
- Used to assess spatial and seasonal variation in potential transmission risk

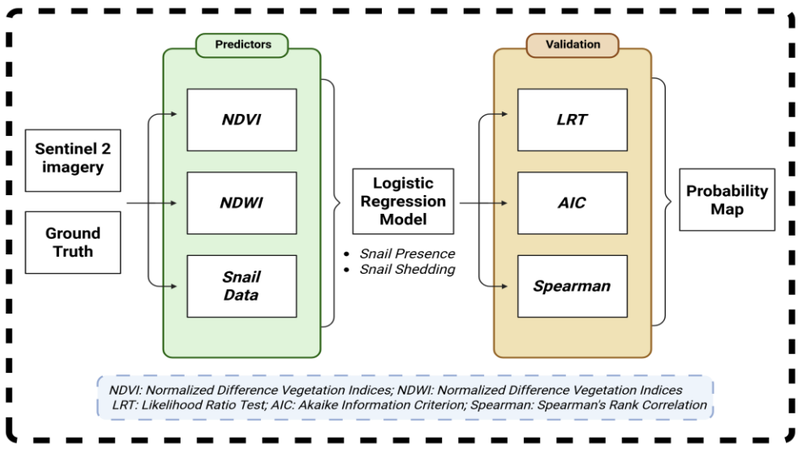
PROJECT AIMS:

✓ Evaluate the **utility** and **consistency** of satellite-derived indices across seasons

## METHODS

This project was based on the prospective cohort **SchistoTrack**[1]

- Snail surveys (2022–2025) linked with Sentinel-2 environmental indices for 3 districts (Buliisa, Mayuge and Pakwach)
- Spatial joins with hex-level indices and covariates
- Exploratory plots and mapping, followed by logistic regression models



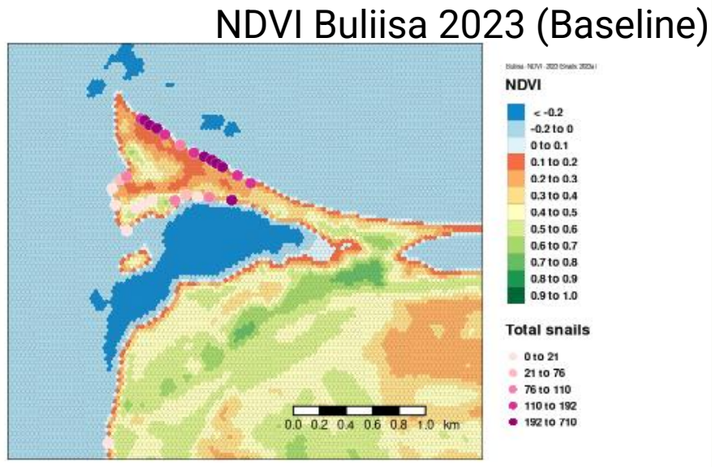

## CONCLUSION

- Remote sensing indices **capture meaningful habitat variation**, with seasonal NDVI/NDWI patterns aligning with known snail environments
- Snail presence and shedding are influenced by both environmental indices and local covariates, supporting their combined use in predictive modelling
- Findings highlight the **potential of satellite data** for guiding schistosomiasis surveillance and control, enabling **more targeted and cost-effective interventions**

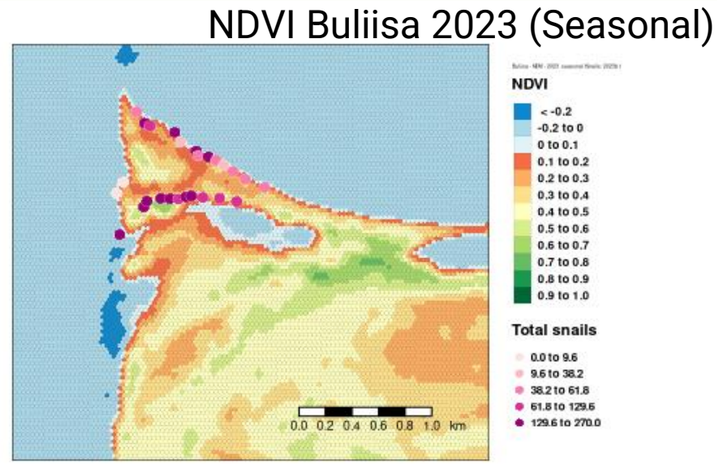
## RESULTS

**Snail presence correlated with environmental conditions**: Spatial clustering was visible near shorelines and water bodies with baseline snail abundance linked to low NDVI (0.1-0.2) and moderate NDWI values (0.3-0.4). Seasonal shifts were found with NDVI values increasing (0.6-0.7) and NDWI values decreasing (<-0.3).

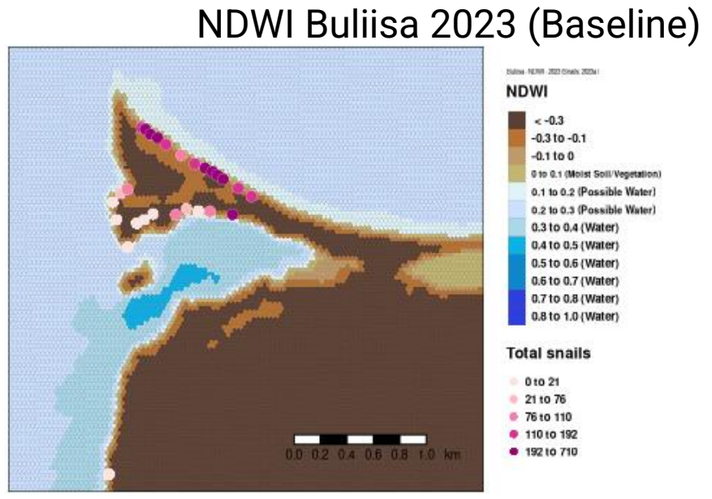
NDVI Buliisa 2023 (Baseline)



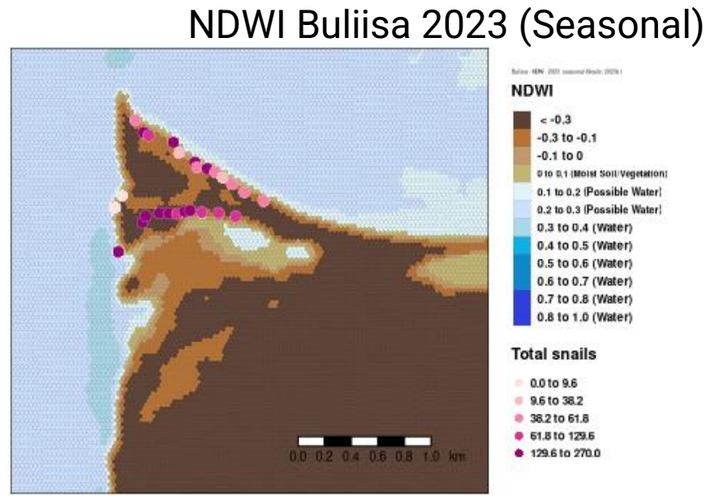

NDVI Buliisa 2023 (Seasonal)



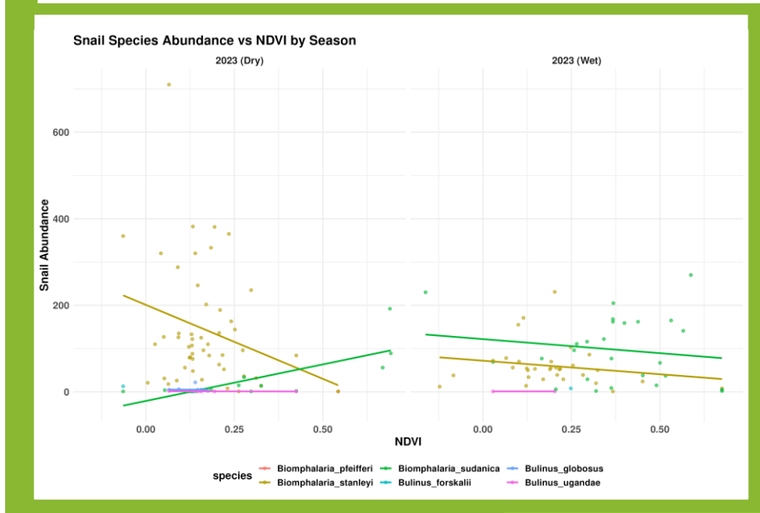

NDWI Buliisa 2023 (Baseline)

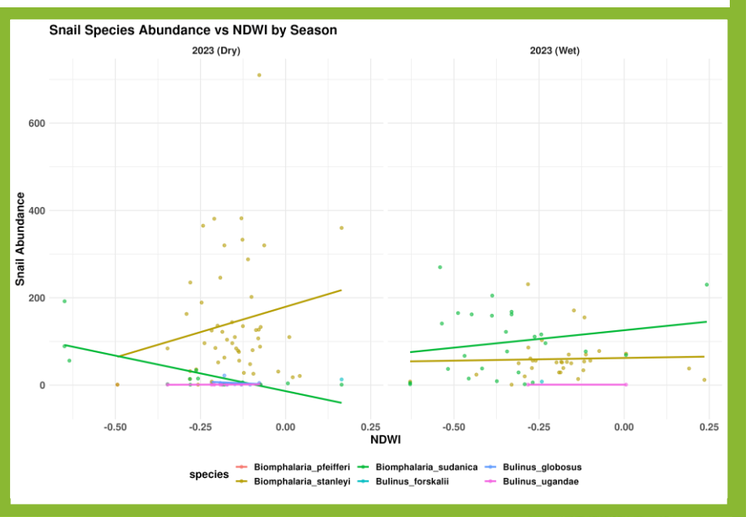



NDWI Buliisa 2023 (Seasonal)




**Environmental indices showed seasonal variation**: District-level differences in NDVI and NDWI were observed, with variation also evident across snail species. District level analysis found Eastern districts having higher (> 0.6) NDVI and lower (< -0.5) NDWI values to Western districts




**Predictive models identified key drivers**: NDVI and NDWI significantly improved model fit in both presence and shedding models (*p <0.05*)

## References

1. Nuffield Department of Population Health, University of Oxford. SchistoTrack: A prospective multimorbidity cohort, 2022. https://www.bdi.ox.ac.uk/research/schistotrack

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