

ATRAP newsletter

Action Towards Reducing Aquatic snail-borne Parasitic diseases



MUST ATRAP II TEAM after a general meeting in Uganda

Welcome!

We are pleased to provide an update on the ATRAP project.

Following the successful completion of Phase I, ATRAP received support through the DGD framework of the AfricaMuseum (Belgium) to further develop its innovative, community-centred approach to protecting communities from vector-borne diseases. Building on the achievements of ATRAP I, the second phase (ATRAP II) adopts a more **action-oriented focus**, while continuing to place active community participation at the core of its methodology. Our planned activities include vector monitoring, manual removal of invasive vegetation and snail vectors, eDNA-based assays to identify actual transmission sites, development and testing of a plant-based molluscicide, and a pilot constructed wetland to improve access to clean water.

However, we need YOU to make these approaches successful! Because only through strong partnerships and sustained exchange can we co-create solutions that make a lasting difference. Therefore, we would like to invite you to our **stakeholder meeting** in **March** this year. More information can be found below.

We are deeply grateful to all the involved community members, village leaders and the entire research team for their continued commitment. Let's make 2026 a successful year!

Dr. Casim Umba Tolo & Dr. Tine Huyse on behalf of the entire ATRAP team

Our mission



To empower communities, advance science, and reduce the burden of vector-borne diseases.

Study area



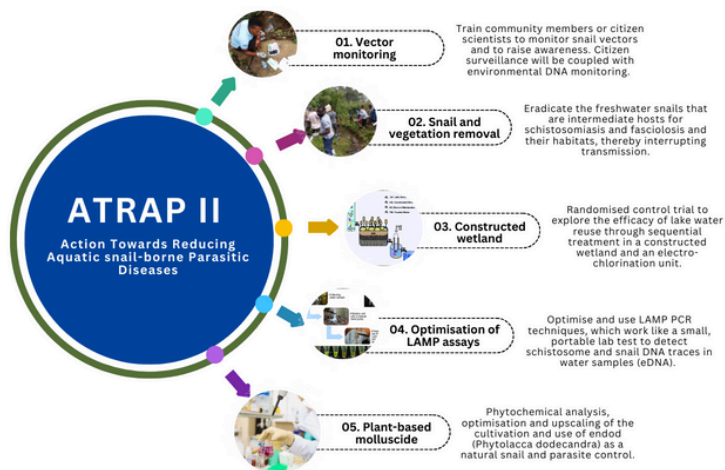
The southern shores of Lake Albert.

Key figures



- 30 community members recruited, trained and equipped.
- Over 1800 reports received.





Planned activities for ATRAP phase II

Citizen scientists

After two months of village-level community entry meetings across all four subcounties in Kagadi district, 30 citizen researchers were recruited, following both community input and guidance from local stakeholders. The selected citizen researchers then underwent a five-day intensive training on schistosomiasis and ATRAP II interventions, including practical sessions in snail identification and the use of digital tools like KoboCollect and the ATRAP App. Real-time feedback was provided to ensure that the citizen scientists would collect high-quality data.



Citizen Researchers and ATRAP II students during on-site training

In 2025, the ATRAP team made major progress by releasing the ATRAP 1 snail dataset: 31,490 quality-checked, georeferenced records from the DRC and Uganda, now publicly available on GBIF and described in our data paper (links on page 5). We also published a study showing that citizen scientists and experts identify the same key environmental drivers of intermediate host snail distributions. Crucially, citizen scientists contributed unexpected observations that expert-only approaches might miss, highlighting the added value of community-based monitoring. We thank all ATRAP citizen scientists and partners for making these achievements possible.

PhD/MSc students

New students (4 PhDs and 2 MScs), working across both biological and sociological disciplines, have joined the project.

Working closely with citizen scientists, the **biology students** collect snail intermediate hosts to identify potential transmission sites of bilharzia and liver fluke disease. These snails are artificially induced to shed cercariae, after which molecular techniques are applied to confirm parasite presence. Additional molecular assays are also developed to detect parasite eDNA in water contact sites to detect actual disease transmission and create risk maps. Finally, lab experiments to test electrochemical disinfection of the free-swimming parasite larvae are currently ongoing.



MSc student Sarah removing vegetation from the water contact points, on the left with Citizen Researchers

The presence of the African soapberry, also known as endod or *Phytolacca dodecandra*, was mapped in Kagadi District, and its saponin extracted and tested for antiparasitic properties. A PhD student is infecting lab-reared Lake Albert snails to assess how saponin inhibits cercariae development, while the same concentrations are tested on non-target species like *Moina* and fish juveniles to assess its environmental impact. Findings will support the development of an endod-based herbal soap for field use.



Biology PhD students: Noelia, Francis, Fred and Godfrey.

The **social science students** are working to strengthen safe WASH (water, sanitation and hygiene) practices in Kagadi District by engaging communities through ethnographic and citizen social science approaches to identify socio-cultural and structural barriers. These approaches aim to identify socio-cultural and structural barriers to WASH adoption and to co-create context-specific solutions with community members. A baseline household survey was conducted among 160 households across four subcounties: Ndaiga, Mpeefu, Kyaterekera, and Kyaterekera Town Council between May and October 2025. This study assessed WASH uptake and examined socio-cultural and structural factors influencing WASH practices.



Master student Sandra engaging community members in a photovoice discussion about WASH.

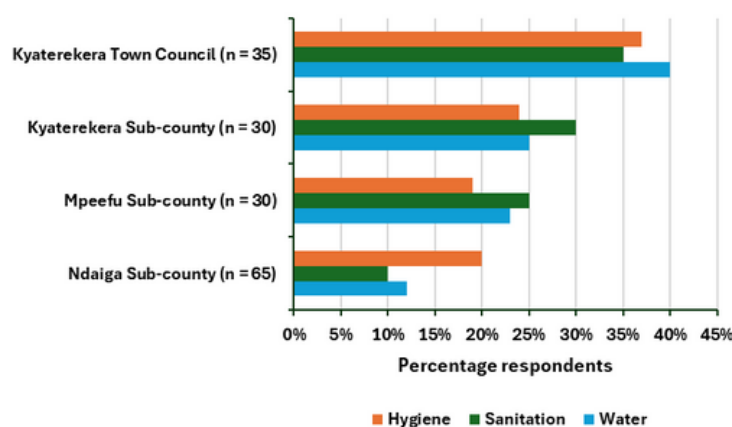
Results - Biology

Preliminary results indicate that exposing human schistosome cercariae and miracidia to saponin concentrations of 5, 7.5, and 10 ppm for 8 hours resulted in over 50% mortality, while 2.5 ppm did not. However, these concentrations did not significantly affect the laboratory bred snails. In contrast, concentrations of 12.5 and 15 ppm achieved 100% mortality of the cercariae and miracidia within 5 and 3 hours, respectively.

Electrolysis using Ru MMO electrodes (50 mA, 30 min, 28 °C, 78 mg/L Cl⁻) produced 1.7 (±0.5) mg/L free chlorine and caused complete loss of cercariae motility, with extended treatment (60 min) leading to clear inactivation. Even without detectable chlorine, low current (10 mA) or graphite electrodes at 50 mA caused sluggish movement, suggesting an intermediate electric-field effect. Ongoing tests aim to confirm these findings and strengthen evidence for electrolysis as a potential water intervention for cercariae inactivation.

Results - Social sciences

Preliminary findings indicate generally low levels of WASH uptake across the study area. Kyaterekera Town Council shows relatively higher utilization of WASH services compared to lake-dependent communities like Ndaiga subcounty. These variations suggest persistent disparities in access to and use of WASH services, particularly in lakeside communities where infrastructural and service delivery constraints remain pronounced. As a result, many residents continue to rely on the lake for daily activities, while the widespread practice of open defecation significantly heightens the risk of schistosomiasis.



Reported household-level uptake of WASH services across selected sub-counties in Kagadi District

Environmental and social factors constrain sanitation in fishing communities e.g., limited land and unstable soils that raise latrine construction costs. Also, the fishing population is transient, with 5 to 15 people hosted per gear owner, who, after spending long hours on the lake (from 3:00 pm to 7:00 am), returns to already strained latrines, causing overuse, poor hygiene, and increased disease transmission risks.



WASH activities at Rwebigongoro, Ndaiga subcounty.



A village meeting in kyaterekera

International conferences

The ATRAP II team made a strong impact at several scientific events in Belgium in 2025. At the 65th ITM Colloquium (4–6 November, Antwerp), the team engaged with global experts on innovations in infectious disease research. At KU Leuven's One Health Day, MUST PhD student Okello Felix presented on community-led WASH interventions for schistosomiasis prevention, highlighting the role of anthropological approaches in fostering engagement, ownership, behaviour change, and sustainability.



Felix presenting at the One Health Day

Additionally, the ATRAP team showcased innovations in vector monitoring and community-led disease control.

At the EU–Africa Innovation Fair in Brussels, MUST PhD student Francis Ssenkuba and Dr Mercy Ashepet presented the AI-powered snail ATRAP-App developed together with GAS, demonstrating its value for schistosomiasis vector monitoring and citizen science data collection. Francis further presented at the RMCA departmental seminar, emphasizing the transformative role of community-based interventions and citizen science in strengthening schistosomiasis prevention in endemic communities.



Francis & Mercy in Brussels at the EU-Africa Innovation Fair

Innovation

Within the ATRAP project, scientific rigor and creativity remain central pillars. Effective disease control is still hampered by a shortage of trained snail experts, largely due to the complexity of snail taxonomy. To address this challenge, the ATRAP project, in collaboration with the GAS & the IT team at Mbarara University of Science and Technology (MUST) and the Royal Museum for Central Africa, has developed an AI-powered object detection model designed to support automated identification of snail vectors up to the genus level.

The model was trained and validated using more than 2,500 snail images submitted by citizen scientists during Phase I. It has now been integrated into the ATRAP snail app prototype, which is currently undergoing testing by the research team and citizen scientists in Kagadi and Ntoroko districts.

Following final refinement, the project intends to scale up the application and make it openly accessible to the public. This innovation will facilitate real-time data sharing, simplify snail identification, and improve the availability of vector data to inform evidence-based policy making.

Upcoming

March 2026: We are pleased to announce a major Awareness Week in our study area, bringing together citizen researchers, the ATRAP team, local stakeholders and community members under the theme ***“Our Water, Our Health, Our Responsibility: Strengthening Community Knowledge & Action for Schistosomiasis Prevention and Control.”*** This event will be followed by a refresher training for the citizen researchers. You are warmly invited to join us, exchange ideas, and strengthen collaboration towards the elimination of schistosomiasis. We look forward to meeting you soon for a lively debate.

Publications

1. Ashepet, M.G., Jacobs, L., Michellier, C., Kagoro-Rugunda, G., Tolo, C.U., Huyse, T. and Vranken, L. (2025) ‘Understanding the Drivers and Constraints to Participation in Citizen Science Programs in Uganda’, *Citizen Science: Theory and Practice*, 10(1), p. 32. Available at: <https://doi.org/10.5334/cstp.773>.
2. Valderrama-Bhraunx, N., Huyse, T., Van Loon, E., Van Rompaey, A., Twongyirwe, R., & Jacobs, L. (2025). Great minds map alike: Citizen and expert distribution models of schistosome snail hosts in rural west Uganda. *Ecological Solutions and Evidence*, 6(4), e70163. <https://besjournals.onlinelibrary.wiley.com/doi/10.1002/2688-8319.70163>
3. Valderrama-Bhraunx, N., Bonifacio, L., Tumusiime, J., Kapour, G., Namirembe, D., Umba-Tolo, C., ... & Huyse, T. (2025). Snail intermediate host occurrence recorded by citizen scientists in rural Uganda and the Democratic Republic of the Congo. *GigaByte*, 2025, gigabyte162-0. <https://gigabytejournal.com/articles/162>
4. Namirembe, D., Huyse, T., Wangalwa, R., Tumusiime, J., & Umba, T. C. (2024). Fasciola and Schistosoma cross-infection risk between livestock and wild mammals in Western Uganda, a One Health approach. *International Journal for Parasitology: Parasites and Wildlife*, 25, available: [10.1016/j.ijppaw.2024.101022](https://doi.org/10.1016/j.ijppaw.2024.101022)

Links:

GBIF dataset: <https://www.gbif.org/dataset/1b001cca-29dd-4446-a0cc-f81b7c939f69>

Acknowledgements

The citizen scientists

The ATRAP team would like to wholeheartedly thank the citizen researchers: Ms. Turyashemererwa Roy, Mr. Bahemuka Bob, Ms. Unimu Hadijah, Mr. Ategeka Augustine, Mr. Alinaitwe Sedrick, Mr. Ochoun Narsis, Ms. Ayiyo Rebecca, Mr. Behwera Ben, Ms. Pacutho Priscar, Mr. Kisoro Timothy, Mr. Musiime Andrew, Mr. Atanasi Marisel, Mr. Mutegeki Jonathan, Mr. Mateso Abel, Mr. Halimpisa Jack, Ms. Natukwasa Allen, Ms. Twesigye Christine, Ms. Kwarikunda Annet, Ms. Natukunda Shiphrah, Ms. Alicwamu Jamindah, Mr. Uzelle Dennis, Mr. Nuwamanya Antony, Ms. Kyaligonza Rosset, Ms. Atuhurra Olivia Christine, Mr. Mananu Liyirwoth, Mr. Okello Geofrey, Mr. Muhumuza Richard, Mr. Bamuturaki Godfrey, Mr. Mugisa Daniel, Mr. Jabero Simon Peter.

Project Investigators

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PhD students

Mr. Francis Ssenkuba, Mr. Fred Besigye, Mr. Felix Okello, Mr. Begumisa Godfrey Magezi and Ms. Noelia Valderrama.

Master's students

Ms. Sarah Nahaboona, Ms. Sandra Kabarisa
Project assistant: Ms. Josephine Nimusiima.

Scan the QR code below to visit our new website that hosts our snail sampling and identification videos and all our publications

ATRAP project information

The ATRAP II project is a collaboration between Mbarara University of Science and Technology (MUST) in Uganda and the Royal Museum for Central Africa (RMCA), the KU Leuven and the University of Antwerp in Belgium, funded by the Belgium Development Cooperation (DGD). It runs from 2024-2028. Four Ugandan and one Belgian PhD students are trained, in addition to two Ugandan MSc students.

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YouTube: <https://www.youtube.com/channel/UCL70WY6W5ILUZj0FSjVNcg>

