# Steps taken to eliminate Senegal's snail plight

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By Lilyann Gardner

Senegal is one step closer to eradicating parasite-carrying snails from their waterways thanks to a team of researchers led by Jason Rohr, Galla Professor and Chair of the Department of Biological Sciences at the University of Notre Dame.

Using drone and satellite imagery, Rohr and his colleagues pinpointed areas of dense aquatic vegetation where snails populated and subsequently removed 433 metric tons from eight villages over the course of three years. As a result, the infection rates of *schistosomiasis*, the world's second most prevalent parasitic disease, decreased among schoolchildren by nearly one third when compared to their counterparts in eight villages that did not undergo vegetative removal.

Conversations with village chieftains also emphasized the dangers schistosomiasis posed to local communities.

Accounting for over 200,000 deaths a year, schistosomiasis infections occur when flatworms are transmitted from snails to humans, creating a range of symptoms from inhibited mental development to organ failure.

"When humans go into water bodies to wash their clothes or swim, they will get infected," said Rohr. "The parasite penetrates the skin of the human host, and we discovered that most of the snails, which is the intermediate host, are found in submerged aquatic vegetation."

The surveillance of agricultural land near the aquatic vegetation revealed that fertilizer runoff exacerbated the situation, promoting vegetative growth. The larger the habitats grew, the more snails there were, and the more snails there were, the higher the rates of schistosomiasis.

Rohr further acknowledged that interventions like vegetative removal often fall prey to the "tragedy of the commons," in which everyone assumes that someone else will take responsibility so no one fully commits to the removal process.

The primary way Rohr combatted this was through economic incentives.

Rohr converted the aquatic vegetation into compost and livestock feed and worked with a group of economists who determined the new feed was 179 times cheaper than traditional feed. He also tested the vegetation in *biodigesters*, sealed containers where microorganisms break down organic matter, and produced fertilizer and cooking gas that could potentially be used to create electricity.

Next, Rohr plans to introduce mechanized equipment to cut the time spent removing vegetation by hand.

“The cool thing about using civil engineering companies is that we can train the point people from those companies on how to use our remote sensing technology, and they can actually track regrowth of the vegetation in real time,” said Rohr.

Another long term goal is the implementation of these innovations in other communities throughout western Africa.

There are currently 116 villages enrolled in a clinical trial to see if vegetative removal is sustainable without foreign assistance. The four treatment arms of this trial involve communities receiving various degrees of education on schistosomiasis intervention to determine which training techniques work best.

After winning the 2024 International Frontiers Prize and receiving a million Swiss Francs, Rohr remains positive that his team will continue to advance these innovations and improve people’s lives.

A complete list of co-authors on this study can be found at Nature.