



- ⊖ **Malawi faces challenges in effectively coordinating water and irrigation projects and addressing vectors and vector-borne diseases, posing significant obstacles to public health and sustainable development.**
- ⊖ **Evidence shows that policies governing water-related projects in Malawi place minimal emphasis on water-based vector-borne diseases.**
- ⊖ **There is a lack of coordination of efforts among key sectors, including health, agriculture, education, and water, this is compounded by insufficient community engagement and participation.**
- ⊖ **There is a need to improve inter-sectoral collaboration by establishing a centralised coordination unit for managing waterborne disease vectors.**

Enhancing Multi-Stakeholder Collaboration for Effective Management of Waterborne Disease Vectors in Large Irrigated Areas in Malawi

Context

An increase in irrigation agriculture in Malawi has precipitated unintended public health consequences, fostering environments conducive to vectors for diseases like malaria, schistosomiasis, and arboviral infections (Kibret et al., 2021). Large-scale irrigation brings health, nutritional and socio-economic benefits, but also alters land-use patterns which can foster insect vectors and pathogens (Steinmann et al., 2006), impacting disease spread. The connection between water management and vector-borne disease control in Malawi is underemphasised, presenting significant challenges for public health (Higginbottom et al., 2021) and sustainable development.

Objective and methodology

Objective

To review existing evidence, evaluating the integration of vector control within agricultural systems in Malawi's climate-vulnerable regions and its implications on prevalent diseases.

Desk Review

We conducted a desk review of existing literature on large irrigation schemes and the control for vector-borne diseases. Sources included systematic reviews, peer-reviewed articles, global health reports, and governmental publications focusing on vector control, agriculture, and infectious diseases in Malawi. There was an emphasis on studies detailing the interplay between water management, agricultural practices, and vector-borne diseases.



Photo credit: Interrelationship of irrigation agricultural systems, communities and vector-borne diseases.

Key findings

Minimal emphasis on water-based vector-borne diseases in Malawi's policies

A noticeable gap in Malawi's current water-related policies is the limited focus on vector management. This oversight potentially increases health risks associated with vectors like mosquitoes and snails, which thrive in water-rich environments (Siderius et al., 2021), and lead to adverse effects on the health of local communities.

The existing policies in Malawi, notably the 2016 Irrigation Policy, prioritise hygiene and sanitation to tackle water-related diseases. However, they lack specific measures for water-based vector-borne diseases. The Shire Valley Vector Control Project (Shire-Vec), a research consortium, is focused on generating evidence to inform government efforts in controlling vector-borne diseases within agricultural systems.

Lack of coordination among key sectors

In Malawi, the control of vector-borne diseases like malaria and schistosomiasis, is hampered by a lack of coordinated efforts among key sectors, notably health, agriculture, education, and water management. Each plays a unique and vital role in addressing multiple challenges of vector-borne diseases. Yet, efforts are often fragmented and less impactful without a cohesive and integrated strategy. This disjointed approach limits the effectiveness of strategies for controlling and preventing these diseases, which are significantly impacted by environmental and socio-economic factors.

The World Health Organization (WHO, 2012) recommends integrated vector management (IVM) as a global strategy for controlling VBDs. IVM is a rational decision-making process for optimal resource use in vector control, and necessitates collaboration between intra-health sectors and non-health sectors (Ng'ang'a, Aduogo, & Mutero, 2021). This is crucial since many countries, including Malawi, grapple with multiple vector-borne diseases, and integrated vector control interventions can be more effective and efficient when supported by strengthened intersectoral collaboration.

However, evidence on the effectiveness of such intersectoral approaches, including IVM, is limited. Many VBD control programmes are predominantly organised under Ministries of Health, with minimal or no collaboration with other government bodies, municipal entities, or community stakeholders. This lack of collaboration and clear segregation of duties, responsibilities, and resources impairs the potential for effective disease control and prevention (Herdiana, Sari, & Whittaker, 2018).

This situation in Malawi mirrors the global challenge of controlling VBDs, which cannot be effectively managed by the health sector alone. Integrated efforts involving various sectors are essential to reduce the burden of these diseases and ensure community health outcomes are not negatively impacted by the expansion of projects like the Shire Valley Transformation Programme (SVTP).

Insufficient community engagement and participation

Global strategies emphasise increased community engagement, regarding this as a cornerstone for effectively implementing vector-borne disease control and prevention. In Malawi, efforts to address VBDs through community workshops, house improvements, and larval source management have been initiated. However, despite the potential of such interventions, community participation has not been a central focus and remain disappointingly subpar (van den Berg et al., 2018; Gowelo, McCann, Koenraad et al., 2020).

Active community involvement is not just beneficial but crucial. Locals offer invaluable insights, understanding of the terrain, and cultural perspectives, which can significantly enhance intervention strategies.

Recommendations

Addressing challenges related to VBDs require a multifaceted approach: a strategic realignment of policies, improved

inter-sectoral collaboration, and fostering a robust community-centric approach to disease control and prevention.

➤ Centralised coordination unit

The government should develop a central body, involving representatives from health, agriculture, water, and education sectors. This ensures streamlined decision-making and resource allocation for vector management (Waage et al., 2022). This recommendation aligns with the principles of integrated vector management (IVM) in optimising resources through cross-sectoral collaboration. In a case study from Nyabondo, Kenya, where malaria is endemic, a centralised unit was established for IVM adoption and sustainability. This approach effectively reached over 25,000 community members, demonstrating the potential for such centralised units in VBD control.

➤ Enhanced communication and collaboration

To manage vector-borne diseases in Malawi effectively, two key strategies are proposed: the introduction of advanced communication technologies and the organization of regular interdisciplinary workshops.

The first strategy emphasises the development of sophisticated communication channels, such as digital platforms, mobile applications, and social media, to facilitate timely and efficient information sharing among crucial stakeholders, including government agencies, healthcare organisations, and research institutions. This enhanced communication is vital for prompt responses to disease outbreaks, effective monitoring of vectors, and dissemination of important public health information, a notion supported by studies like those of Smith et al. (2015) and Jones et al. (2017).

The second strategy involves holding regular workshops that bring together various sectors, including health, environmental science, education, and agriculture, as well as various groups such as local leaders, healthcare professionals, and community members. This promotes a collaborative approach in addressing

the multifaceted socio-economic and environmental aspects of vector-borne diseases. These meetings should include ensuring that everyone is aligned with the goals and methods of vector-borne disease control. This collaborative approach not only fosters a sense of accountability among all parties but also allows for the adaptation of strategies to address emerging challenges or trends.

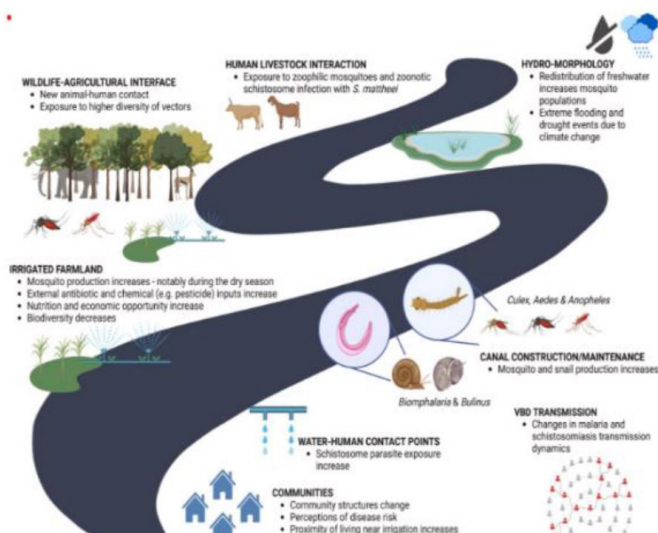
Research, including the work of Higginbottom et al. (2021), underscores the importance of such cross-sectoral collaboration in improving public health outcomes. By regularly bringing together diverse perspectives and expertise, these meetings can facilitate more dynamic and responsive vector control strategies, which are crucial in the ever-evolving landscape of vector-borne diseases (Bartumeus et al., 2019).

➤ Community engagement

Comprehensive consultation campaigns should be launched, integrating local languages and cultural narratives. This approach, as advocated by Seward et al. (2021), is fundamental in ensuring that communities play an active role in vector control initiatives. The use of shared language and the understanding of contextually relevant priorities can significantly enhance collaboration with local communities as a crucial partner in the success of these interventions.

➤ Policy realignment

The revision of water management and health policies should include clear guidelines on vector control and disease management within irrigation schemes is crucial. This approach recognises the significant role that water management plays in the life cycle of vectors, such as mosquitoes, which are responsible for transmitting diseases like malaria. By integrating vector control measures into water management policies, the government and relevant stakeholders can create a more proactive and effective response to the threat of vector-borne diseases (WHO, 2012). This integration would involve assessing and modifying irrigation practices, ensuring that they do not



inadvertently create breeding grounds for disease-carrying vectors.

➤ Research and technological integration

Encouraging research on disease prevalence, especially in new irrigation areas, is crucial for identifying and understanding the dynamics of vector populations and the diseases they carry. Research can provide valuable insights into the impact of environmental changes, such as

those caused by irrigation, on vector-borne disease risks. The findings from such research can then be used to tailor and fortify intervention strategies, ensuring they are effective and relevant to the specific contexts of these areas. Additionally, fostering innovation through grants and partnerships can spur the development of new technological solutions for vector monitoring and control. This could include advanced data collection tools, predictive modelling for disease outbreaks, and innovative vector control technologies. Such technological advancements can significantly improve the efficiency and effectiveness of vector management programmes.



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