


ONE HEALTH CASES

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A Decade of One Health Implementation in Somalia: Challenges and Opportunities for Institutionalization

The One Health assessment in Somalia used key informant interviews, focus group discussions, desk review and a net mapping exercise. The assessment identified critical gaps in capacity, funding, and policies related to collaboration, and advocacy, highlighting the need for engaging key stakeholders to drive the institutionalization of One Health initiatives in Somalia.

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Abstract

One Health (OH)-oriented initiatives are essential for addressing complex health challenges in Somalia given the country's economy depends heavily on the livestock, agriculture, and marine resources. The Capacitating One Health in Eastern and Southern Africa (COHESA) project supported a comprehensive assessment of the status of OH in Somalia through 21 key informant interviews, two focus group discussions, a desk review of secondary data and net-mapping with OH stakeholders. This multi-faceted approach aimed to deepen the understanding of OH concepts and their interconnectedness with human, animal, and ecosystem health. The study identified several critical challenges and opportunities within the Somali context, focusing on innovations in governance, education, and implementation. Key findings revealed significant gaps, including limited infrastructure, insufficient government funding for OH initiatives, and an overreliance on external donor support. Moreover, there is a notable lack of institutionalization of OH within various government sectors, which hinders effective collaboration. This assessment underscores the urgent need for enhanced funding, capacity building, and the establishment of sustainable governance structures. By addressing these gaps, Somalia can leverage OH principles to improve health outcomes for humans, animals, and the environment, thereby fostering a healthier and more resilient society.

Introduction

Somalia is a nation emerging from over three decades of conflict. The fragmented healthcare system – impacted by civil unrest – limits access to reliable data on disease burdens. Nevertheless, as livestock rearing is the primary livelihood for over 70% of the population and contributes approximately 60% to the country's GDP, a high prevalence of zoonotic diseases is expected (Mumin *et al.*, 2023). The country is increasingly vulnerable to climate change effects, including recurrent droughts and floods. This context underscores the critical intersection of human, animal, and environmental health and the need for OH approaches.

Learning Outcomes

The Somalia One Health case aims to achieve the following learning outcomes:

1. Understand the level of institutionalization and level of operationalization of OH activities in Somalia at national and sub-national levels.
2. Characterize the OH education currently available in Somalia and the identified gaps.
3. Understand the status of OH capacity building, lobbying, advocacy, networking, and funding for OH activities in Somalia.

Background and Context

One Health is a holistic and collaborative approach designed to sustainably balance and improve the health of humans, animals, and ecosystems. It acknowledges the deep interconnections between human health, the health of domestic and wild animals, plants, and the broader environment, including ecosystems (Adisasmito *et al.*, 2022). OH-oriented initiatives could significantly impact Somalia towards managing complex problems affecting the health of humans, animals, and the environment. The term "One Health" was first introduced to the global scientific community in September 2004 and later introduced in Somalia in 2013 (Hassan-Kadle *et al.*, 2023). However, it did not gain significant momentum in Somalia until the implementation of the One Health Regional Network for the Horn of Africa (HORN) project in 2018. HORN (Available at: <https://onehealthhorn.net>, accessed 15 December 2024) was a UK-funded project which aimed to strengthen One Health research capability in the region. It funded a number of small research projects in Somalia and went on to support the national One Health zoonotic disease prioritization workshop for Somalia in 2023 (Osman *et al.*, 2023).

Somalia faces risks of emerging pandemic threats and other global health threats such as antimicrobial resistance (AMR), endemic and transboundary zoonotic diseases, food and water-borne illnesses, and biohazards (Somalia-UN, 2020). The country is home to nomadic pastoralist communities who frequently migrate in search of water and grazing land for their livestock. These movements, often extending beyond national borders (FEWS, 2010), expose pastoralists to a heightened risk of encountering zoonotic pathogens such as Rift Valley Fever (RVF) and anthrax. The high morbidity and mortality rates associated with these diseases can have devastating effects on the health and livelihoods of affected communities, severely impacting food security and the economic stability of pastoralist households.

While national health policies and regulations exist for both human and animal health services, a formal integrated OH approach structure remains absent in Somalia (Hassan-Kadle *et al.*, 2023). The previous OH strategic plan (2017–2021) was structured around five core themes: coordination, human resources, surveillance, research, and communication. While it laid the groundwork for OH initiatives, the plan has become outdated, necessitating revisions to address current challenges and incorporate advancements in these critical areas. Furthermore, with the establishment of the Ministry of Environment and Climate Change on August 9, 2022, after the previous plan's development, it is crucial to reassess stakeholder collaboration to address OH's challenges effectively.

Recent OH initiatives in Somalia illustrate efforts to address these challenges. Collaborations include partnerships with the Kenya Zoonotic Diseases Unit (ZDU) to formulate operational plans for managing transboundary outbreaks of RVF and brucellosis. Other significant initiatives encompass the One Health Network for the Horn of Africa (HORN) project collaborated in Amoud University (AU) (IRLI, 2023), the One Health for Humans, Animals, and Livelihoods (HEAL) project (Mor *et al.*, 2024), the Abrar One Health Centre (Hassan-Kadle *et al.*, 2023), COHESA (Richards *et al.*, 2024), and Global Implementation Solutions (GIS) One Health program in Somalia (Hassan-Kadle *et al.*, 2023).

Furthermore, AU hosted the first OH gathering event in Somalia backed by the HORN project in 2022, resulting in the Borama OH declaration in the Horn of Africa (SomalilandCurrent, 2022). After HORN, AU advances in OH governance include a formal workshop in 2023, supported by the University of Liverpool and WHO, which prioritized zoonotic diseases (Osman *et al.*, 2023) using the One Health Zoonotic Diseases Prioritization (OHZDP) tool (Rist *et al.*, 2014). A multisector stakeholder group identified the top seven zoonotic disease priorities in Somalia, including RVF, Middle East respiratory syndrome, anthrax, trypanosomiasis, brucellosis, zoonotic enteric parasites, and zoonotic influenza viruses. Contingency plans for diseases such as brucellosis and RVF have also been developed as part of this ongoing effort.

OH initiatives in Somalia require significant strengthening to address persistent health challenges. This assessment is justified by the need to enhance national coordination mechanisms, improve OH research capacities, and integrate OH principles into educational curricula to foster a holistic understanding of health (Hassan-Kadle *et al.*, 2023).

Here, we present the findings on the status, opportunities, and challenges of OH in Somalia and recommend strategies to promote and institutionalize the approach.

Transdisciplinary Process

Amoud University, with support from the Capacitating One Health in Eastern and Southern Africa (COHESA) project, initiated a comprehensive baseline survey aimed at assessing the status and existence of OH baseline indicators and activities within Somalia. The main goal was to establish a foundational understanding of OH implementation and its key metrics across the country. This study employed

a descriptive cross-sectional survey design, incorporating a total of 21 key informant interviews (KIIs), two focus group discussions (FGDs) with seven and eight participants, respectively, and a desk review. Participants were purposively selected for their expertise in OH research, governance, education, and implementation across the various sectors/disciplines that work and contribute to OH. FGD participants were partially made up by KII and in some instances new individuals were selected using the same criteria. Structured facilitation techniques were employed to stimulate dialogue in the FGDs, encourage participation, and elicit diverse viewpoints on OH's challenges and solutions. FGDs offered a dynamic environment for brainstorming ideas, exploring common concerns, and identifying shared priorities among participants. The discussions took about 80 min each and the data collected from FGDs encompassed group dynamics, consensus-building processes, and emergent themes, captured through detailed notes and recordings. The collective wisdom and insights gleaned from these discussions provided a rich source of qualitative data, complementing the findings from KII interviews. Data was analysed using Statistical Package for Social Sciences (SPSS) version 25.

In addition, an OH net-mapping workshop was organized in Somalia and employed a participatory, interview-based tool developed by the International Food Policy Research Institute (Schiffer and Waale, 2008). This method helps visualize and analyse complex networks by identifying key actors, their relationships, and levels of influence. Participants, selected through purposive sampling for their knowledge of OH, plotted stakeholders on a grid based on their perceived interest and power. Linkages between actors – such as collaboration, coordination, funding, capacity-building, and advocacy – were color-coded and mapped, with influence towers added to signify each actor's impact. This exercise provided a strategic view of the OH network and its gaps.

Overview of participants in key informant interviews and focus group discussions

The gender distribution among the respondents was heavily skewed, with 19 males (90.5%) and only 2 females (9.5%), indicating a significant gender imbalance. one of the participants in the FGD mentioned that:

“Women are important in the implementation of OH because they are the ones who take care of the house and home, preparing food for the family and working on the garden and also engaged in taking care of animals” (FGD1).

This sentiment from a FGD participant was an indication that the women's participation in OH is mainly linked to daily activities in Somalia and not key decision making in higher positions, hence the low number of women represented in the KII. The average age of the respondents was 36.1 years while on average they had been working with their current organizations for 7.6 years (Table 1). This suggests that the majority were in the mid-stages of their professional careers.

Table 1. Overview of key informants on One Health in Somalia.

Characteristics	Count	Percentage (%)
Gender		
Male	19	90.5
Female	2	9.5
Education level		
Tertiary diploma	1	4.8
Tertiary degree	20	95.2
Position		
CEO/top of organization	1	4.8
Senior manager	8	38.1
Junior manager	3	14.3
Employee	9	42.9
Organization type		
Government	13	61.9
Academia	5	23.8
NGO/INGO	2	9.5
Private institute	1	4.8
Field of expertise		
Veterinary medicine/animal health	8	38.1
Public health	4	19.0
Plant science/plant health	3	14.3
Others (human medicine, laboratory, economics, natural sciences, etc.)	6	28.6

In terms of education, the informants exhibited a high level of academic achievement, with 20 (95.2%) holding a tertiary education degree, encompassing Bachelor's, Master's, and Ph.D. levels. There was only one respondent (4.8%) with a tertiary education diploma, highlighting a group predominantly composed of highly educated individuals which was expected based on the purposive sampling employed. The respondents represented a variety of institutes as well as sectoral representation with more representation from the animal health sector (Table 1).

FGDs provided a platform for engaging diverse stakeholders in Northern Somalia (n = 7, FGD1) and North-eastern and Central Somalia (n = 8, FGD2) with interactive discussions on OH status (Table 2). Participants of FGD1 came from various backgrounds, including community members, international NGOs, academia, and government bodies including, the Ministry of Health Development, Ministry of Environment and Climate Change, and Ministry of Livestock were invited to share their perspectives. In FGD2, the Ministry of Health, National Institute of Health (NIH), Ministry of Livestock, Forestry and Range (MOLFR), Ministry of Agriculture and Irrigation (MOAI), Ministry of Environment and Climate Change, Hirshabelle State, Medair Organization, and Zam Zam Foundation were invited to express their viewpoints in a collective setting.

Table 2. Demographic profile of participants in focus group discussions 1 and 2 on Somalia's One Health status.

Characteristics	Percentage (%)
Gender	
Male	86.7
Female	13.3
Education level	
Tertiary diploma	0.0
Tertiary degree	100.0
Organization type	
Government	60.0
Academia	20.0
NGO/INGO	20.0
Private institute	0
Field of expertise	
Veterinary medicine/animal health	26.6
Public health	20.0
Plant science/plant health	26.7
Others (human medicine, laboratory, economics, natural sciences, etc.)	26.7

Research and innovation

Although the OH concept has gained increased attention in Somalia in recent years, research endeavours remain constrained by systemic challenges, including a lack of sustained capacity-building initiatives and long-term investment and an inadequate supportive environment. To strengthen local understanding of OH dynamics in Somalia, there is a need to investigate various dimensions of the OH framework, encompassing human, animal, and environmental health simultaneously. KIs and FGDs indicated that high-priority areas for research include high-risk populations such as pastoralists and vulnerable groups like internally displaced people (IDPs). KIs and FGD participants also indicated it is essential to invest in the development of local researchers through training and mentorship. Additionally, the enhancement of laboratory infrastructure is crucial to support long-term, independent research on OH issues in Somalia.

The literature review highlights the prevalence of zoonotic diseases in Somalia, such as brucellosis, RVF, toxoplasmosis, anthrax, zoonotic enteric parasites, zoonotic influenza viruses, and trypanosomiasis, among others. Concerns around food safety arise from the improper use of antibiotics in treating animal diseases, followed by their subsequent slaughter for meat, which increases the risk of antimicrobial resistance – especially in pathogens like *E. coli* and *Staphylococcus aureus* that can transfer to humans. Research on OH in Somalia has historically been dominated by studies on zoonoses, with a significant number of publications dating from the 1970s to 2010. However, recent initiatives, such as HORN, have aimed to revitalize research efforts, though their full impact on academic outputs and capacity building may not yet be fully realized. Consequently, these were excluded from this review, which prioritizes current OH research themes. This underscores the need for updated studies to enhance understanding of OH topics in Somalia—a gap that was further emphasized by insights from KIs and FGDs. For instance, informants from the climate sector highlighted the importance of addressing climate-driven health issues, including water scarcity and vector-borne diseases. The inclusion of these findings broadens the scope of OH considerations in Somalia and emphasizes the need for multisector collaboration.

Governance

The Somalia One Health National-Level Technical Working Group (OHNLWTWG) was inaugurated in 2018 and underwent reappointment in 2023 and is responsible for OH in Somalia (Hassan-Kadle *et al.*, 2023). The OHNLWTWG is comprised of representatives from the Ministries of Health, Livestock, Environment, and Agriculture. According to the KIIs, The OHNLWTWG demonstrates significant interest in OH implementation; however, irregular meetings and lack of budget allocation hinder progress, resulting in a lack of tangible milestones in operationalizing OH practices nationwide.

With technical assistance from the World Health Organization (WHO) Somalia country office and other health development partners, the Federal Ministry of Health and Human Services (FMOH) has developed Somalia's national technical guidelines for integrated disease surveillance and response (WHO, 2024). These guidelines were formulated through multiple consultations, following WHO guidance, and incorporating experiences and lessons learned from implementing the Early Warning Alert and Response Network (EWARN) and other vertical surveillance systems in Somalia. The guidelines encompassed various aspects such as detection, reporting, analysis, feedback, outbreak investigation, preparedness, response, risk communication, supportive supervision, and monitoring and evaluation under the IDSR framework. Although the surveillance system appears integrated, it primarily reports only human-specific diseases and does not capture zoonotic diseases. Apart from the OH governance documents at a national level, we asked KIIs and FGDs about institutional-level OH policies or documents. Most organizations were identified to have plans or ongoing activities related to OH but lacked formalized policy documents. On the question of challenges for the full implementation of OH in Somalia, it emerged that policy gaps and lack of institutionalization were among the top challenges that were being faced:

"In Somalia, we have established a national technical working group but not having a policy to anchor it within the overall national operations" FGD1.

"Silo working mentality which is a major barrier to the workings of the government ministries, can be cured by housing the OH unit in the Prime minister's office but in a step-by-step approach to avoid failure of operationalization due to political influence" FGD2.

"We have no single policy that is specific to OH in the whole Somalia" FGD1.

There was a consensus among the participants that there were no policies on OH that could institutionalize OH in Somalia despite the formation of the technical working groups that were existing and executing OH activities. Participants emphasized the importance of adopting and institutionalizing the OH approach for disease management and prevention. They highlighted that this approach should be integrated into training and capacity-building initiatives to ensure its effective implementation. Participants from the FGDs mentioned that:

"I have been working in OH approach for the last 5 years and I have realized that training and capacity building enables smooth implementation of One Health activity" FGD1.

"The role of training belongs to academia hence we have formed a collaboration coordinated from our institution engaged in OH training involving all the relevant professionals like human health care workers, animal health, environmental and plant health experts" FGD2.

The net mapping indicated that NGOs and UN agencies would be the primary influencers in the process of institutionalizing OH, as they are the major financiers of the project. In contrast, government ministries primarily played roles in coordination, hosting, and providing secretariat support.

Overall, various ministries have plans or strategies related to OH, but they are not endorsed, and, in some cases, there are no explicit documents to formalize their work. The OHNLWTWG has an outdated OH strategy, but no policy is publicly available. Across national and institutional levels, there is a lack of endorsed OH documents to guide the use of the OH approach, and those that do exist tend to focus on zoonotic diseases; guidance on AMR, food safety, and social and environmental sciences are comparatively lacking. FGD participants observed that existing plans often lack sufficient detail about their content and scope, making them hard to put into practice. A positive point raised was the need for OH to be collaborative and cross-sectoral, aligning with OH principles. However, both KII and FGD participants frequently noted that much of the OH strategy and policy focus is on future plans rather than on actions currently in place or planned for implementation. This highlights the gap between the institutionalization of OH in Somalia and its actual operationalization.

Education

There is growing interest within higher education institutions to incorporate OH education into their programs, yet a comprehensive curriculum remains elusive according to the KII and FGD participants. The lack of a comprehensive OH curriculum was underscored during key events such as the Borama OH meeting in 2022 (SomalilandCurrent, 2022) and the second Abrar OH Conference in Mogadishu in 2024 (SOHC, 2024a) where vulnerabilities in OH including zoonotic diseases and gaps in governance, education, capacities, collaboration and cooperation in matters OH were highlighted (Hassan-Kadle *et al.*, 2023). Despite not having a standard OH curriculum in Somalia, various OH education initiatives are being implemented. Golis University in Hargeisa has forged a collaboration with Jigjiga University in Ethiopia to offer an MSc program in OH. Additionally, Abrar University in Mogadishu has established a postgraduate certificate program in OH (SOHC, 2024b). AU is also set to launch an MSc program in OH in 2025, further enriching educational opportunities in this field (Amoud University representatives attending the FGD confirmed). The government's emphasis on health education in secondary schools presents a unique opportunity to integrate OH principles into the school curriculum (Hassan-Kadle *et al.*, 2023). Participants of the FGDs felt it was important to offer formal OH education, indicating that OH is on the education agenda, even if not strictly formalized or standardized between education institutions.

"Of course, yes the formal training is very necessary for cognitive and psychomotor skills in the implementation of OH in Somalia" FGD1.

"My thinking is that there is a need to mainstream OH in the existing programs to facilitate formal training, but it cannot run as a separate profession but can be helpful as cross cadre competency area" FGD2.

The data from KIIs and FGDs sheds light on various training programs, their scope, impact, and evaluation methods (Table 3). Many respondents (47.6%) indicated that their workplaces did not offer specific training in OH, suggesting either a gap in training availability or a lack of awareness about existing programs. Among those who did report that their institutions provided training, the courses covered a wide range of topics related to human, animal, and environmental health, reflecting a broad approach to education in these fields (Table 3). The courses varied in level, with some being graduate-level programs while others were short courses or open to participants from diverse educational backgrounds. Despite this variety, nearly half of the respondents (47.6%) did not specify the course levels, pointing to inconsistencies in the data or gaps in their knowledge. Gender representation among graduates showed a skew towards male participants, though this varied across different training programs.

When it came to evaluating training outcomes, half of the respondents reported measuring graduate satisfaction, and 60% indicated that changes in graduates' knowledge, attitudes, and practices were assessed, highlighting a strong emphasis on immediate outcomes. However, linking the training to broader impacts on human, animal, and environmental health was less consistent, with 47.6% of respondents not providing data in this area. This indicates room for improvement in how training outcomes are evaluated. Courses were synthesized into levels of offer in the education hierarchy, measurement of graduated satisfaction, change in knowledge, attitude and practice and how the change was linked to health and are summarized in Table 3.

Overall, the information collected from the KIIs and FGD participants highlights a consensus on significant gaps in OH education across various institutions and organizations. Respondents identified multiple issues contributing to these gaps, including the novelty of the OH concept, a lack of foundational courses, and insufficient collaboration among relevant sectors:

"OH education is still a new idea in Somalia and therefore many institutions are yet to implement or mainstream the elements OH in the training programs or short courses for competency building" FGD1.

"We have limited training institutions on OH in Somalia and are only restricted to Mogadishu or regional capitals, there is a need to have the training of one health spread across Somalia" FGD2.

Key points raised by the respondents include the novelty of the OH concept, which contributes to educational gaps as it is still emerging in many regions, leading to limited understanding and implementation. A common suggestion is to introduce postgraduate and foundational OH courses to strengthen knowledge among professionals. Specific areas needing improvement include community OH education, especially for herders who often lack formal education, emphasizing the need for accessible, relevant training. The lack of collaboration among key ministries, such as health, livestock, environment and agriculture, is frequently cited as a barrier to effective OH education and practice. Respondents also recommend topics for OH training, such as ecosystem health, the role of OH in organizations, and zoonotic

Table 3. One Health-related training or education offered by institutions of key informants and focus discussion group participants in Somalia.

Training name	Description	Level of course	% Graduates	Graduate satisfaction measured	Change in KAP	Change linked to health measured
AMR Awareness to Pharmacists	Training aimed at increasing pharmacists' awareness of antimicrobial resistance.	Graduate Level	50% Male	Yes	Yes	No
Antimicrobial Resistance	A course focused on understanding and combating antimicrobial resistance.	Short Course	60% Male	Yes	Yes	Yes (reduction in AMR)
Community Animal Health Workers Training (CAHWs)	Training designed for community workers to enhance animal health and manage community-level health issues.	Open	65% Male	No	Yes	No
Diseases Surveillance Training	A course to train professionals in monitoring and managing disease outbreaks and surveillance.	Short Course	70% Male	Yes	Yes	Yes (data on animal diseases)
One Health Training	An interdisciplinary training program that integrates human, animal, and environmental health.	Graduate Level	80% Male	Yes	Yes	Yes (improved knowledge)
Post Graduate Certificate of One Health	An advanced certificate course providing in-depth knowledge of the OH concept.	Graduate Level	30% Female	No	No	No
Prevention of Zoonotic Diseases	Training focused on strategies and practices to prevent diseases that can be transmitted from animals to humans.	Graduate Student Level	45% Female	Yes	Yes	Yes (reduction in zoonotic diseases)
Rangeland Management	A course on managing rangelands sustainably to support animal health and ecosystem balance.	Primary Level	50% Female	Don't Know	Don't Know	Yes (forages for animals improved)
Toxicology	Training in the study of the adverse effects of chemicals on living organisms.	Short Course	60% Female	Yes	Yes	Yes (proper use of vet drugs)
Training on CAHWs about Zoonotic Diseases	A specialized course designed to improve CAHWs understanding on zoonotic diseases.	N/A	No data	No	No	No

diseases. The absence of dedicated OH initiatives and trained lecturers is seen as a critical gap hindering the development of OH education. Finally, funding constraints, low awareness, competing priorities, and lack of coordination across governmental sectors are major challenges to advancing OH education. Sectoral silos is a further challenges that need to be addressed to improve OH education.

The identified gaps have led to the following suggestions from KIIs and FGDs in an attempt to bridge and enhance the efficiency and effectiveness of OH education in Somalia: development of a foundational course in OH, integration of training on ecosystem health, understanding the importance of OH with various organizational contexts, understanding the cross-sectoral and trans-disciplinary nature of OH issues such as zoonoses and public health, integrated methodologies in OH for cross-sectoral and trans-disciplinary OH approaches, and OH skills in communication and collaboration.

Implementation of One Health in Somalia

Implementation is the most challenging aspect of OH identified in Somalia as identified through the KIIs, FGDs, and the desktop review. OH activities at the national level rarely leave government discussion tables and conferences and at the community level, people are not aware of risks that OH approaches can prevent. The OH for Humans, Environment, Animals, and Livelihoods (HEAL) project is one of the few OH implementation projects at the community level in the Gedo region of Somalia (Mor *et al.*, 2024). The 12-year HEAL project, funded by the Swiss Agency for Development and Cooperation (SDC) and other donors, aims to transform health services in pastoralist regions of Ethiopia, Kenya, and Somalia by creating "One Health Units" (OHUs). Scaling of these integrated service delivery approaches could be achieved by linking with existing community health programs managed by universities throughout Somalia.

Some of the NGOs are part of the efforts to the implementation of OH approaches in Somalia. Notable OH activities in Somalia, particularly in zoonotic disease response, include efforts such as the national COVID-19 response, led primarily by the WHO in collaboration with federal and regional governments. Other key initiatives focus on AMR and disease surveillance, spearheaded by OH stakeholders to strengthen health systems and coordination across sectors.

The responses from KIIs regarding the level of OH implementation in Somalia show a varied picture. A notable 28.6% of the participants indicated no awareness of implementation of OH in Somalia that was currently ongoing. Another 47.6%, suggested low to moderately low implementation of OH in Somalia, and 23.8% of respondents view the implementation level of OH in Somalia as moderate, indicating some progress in integrating OH principles and approaches. There were no responses indicating a high or full level of the implementation of OH approaches in Somalia, highlighting a potential gap in the complete adoption of OH approaches.

Synergies with other One Health activities in Somalia

To effectively drive OH in Somalia, it is crucial to maintain ongoing and meaningful interactions among the government, academia, private sector, and NGOs. These collaborations are essential for mobilizing key components necessary for enhancing OH implementation, such as capacity building, funding, coordination, collaboration, and networking.

As one participant noted, *"Our center for training in OH has received support from external donors due to the collaboration among the government, academia, private sector, and NGOs. We are now successfully offering short courses on OH with academic backing, which is working perfectly well for us"* (FGD1). Another participant emphasized, *"Collaborating across these sectors helps break down silos, fostering the spirit of One Health by enabling us to work together towards a common goal and making the practical implementation of OH more logistically feasible"* (FGD2).

Almost all respondents (100%) agree that OH fosters transdisciplinary collaboration, enhancing efficiency across health domains. It promotes systems thinking, emphasizes the interconnectedness of health sectors, and encourages participation. OH contributes to resilience and sustainability in health systems, clearly defining each sector's roles while demonstrating resource savings and the cost-effectiveness of integrating human, animal, and environmental health strategies.

The OH synergy in Somalia faces several significant hindrances. Limited awareness among stakeholders results in an insufficient understanding of OH principles and practices, which hampers effective engagement. Security challenges further complicate matters, as safety concerns hinder the implementation of OH programs. Additionally, there is a lack of intersectoral collaboration between health, agriculture,

and environmental sectors, undermining holistic approaches. Climate change also poses a considerable threat, with its effects – such as flooding and drought – exacerbating health risks. Political instability disrupts the continuity and effectiveness of OH interventions, while reliance on donor-driven initiatives creates dependency and may lead to shifts in priorities, complicating the sustainable implementation of OH in the region.

OH provides key opportunities to improve health outcomes in Somalia. Strengthening institutional capacity enhances the infrastructure for OH initiatives. By leveraging existing knowledge, stakeholders can adopt collaborative approaches to health challenges. The OHNLWTWG can facilitate coordination across sectors, while integrated disease surveillance systems improve monitoring and response to health threats. Focusing on zoonotic diseases like RVF, MERS-CoV, and anthrax effectively addresses critical health concerns. Increased funding advocacy will further support OH initiatives and research. This approach fosters collaboration among diverse professionals, enabling effective prevention, detection, control, and response to complex health issues affecting humans, animals, plants, and their environments. Such collaboration addresses multifaceted health challenges and maximizes efficiencies from these synergies.

Project Impact

The COHESA project has significantly raised awareness of OH among relevant stakeholders while identifying existing gaps in its implementation in Somalia. It has also contributed to enhancing the research and innovation capacities of participating institutions concerning OH issues. The project has been well received in Somalia as it supports existing structures for OH implementation. This initiative has energized and catalysed efforts to further institutionalize and operationalize OH in the country.

The gender imbalance among the participants reflects broader patterns of gender disparity in Somalia, which was noted during the study. This imbalance is influenced by cultural norms and limited opportunities for women to participate in decision making roles within the health, livestock and environment sectors. To address this challenge, the authors recommend culturally sensitive capacity-building initiatives tailored to empower Somali women, mentorship programs led by female role models in the One Health field, and policy reforms that mandate gender inclusion in administrative roles. Additionally, the creation of women-focused One Health networks and greater representation of women in educational and leadership training can help address systemic barriers and foster long-term change.

COHESA facilitated the net mapping of key stakeholders and influencers in OH implementation, leading to essential deliverables such as lobbying, advocacy, capacity building, and fostering collaboration to influence the institutionalization of OH. Net mapping is a process where key actors map relationships between stakeholders towards a common goal such as who influences the institutionalization or operationalization of OH in Somalia. A separate paper has discussed the detailed results of the net mapping exercise.

The OH Stakeholder Net-mapping workshop in Somalia highlighted the challenges and opportunities in implementing the OH approach. Despite being a signatory to international agreements, Somalia struggles with political instability, inadequate infrastructure, and fragmented efforts in OH implementation. The workshop, organized by Amoud University under the COHESA project and facilitated by the International Service for the Acquisition of Agri-biotech Applications (ISAAA), identified key stakeholders such as government ministries, UN agencies, NGOs, and academia. Critical gaps include a lack of surveillance systems, insufficient laboratory capacity, and weak coordination and silos among stakeholders. Recommendations from the workshop emphasized the need for legislation to institutionalize OH, engage key ministries for sustained funding, and strengthen advocacy efforts to secure government support. Enhancing coordination and capacity-building, particularly in veterinary and public health sectors, is crucial for long-term sustainability. Overall, while the OH framework in Somalia relies heavily on external support, a more structured and formalized approach is necessary to achieve effective and sustainable OH outcomes.

To address the identified gaps, the COHESA Somalia team has initiated several activities aimed at grounding and institutionalizing OH. These initiatives include integrating OH into the primary and secondary school curriculum, developing training programs in higher education for universities and tertiary colleges, conducting community-level capacity-building programs on OH and planning to update Somalia's OH national strategic plan using JPA guidelines. The findings from this case study will have a lasting impact by ensuring that OH stakeholders have a better understanding of the OH landscape, including its challenges and implementation gaps in Somalia.

Project Outlook/Conclusions

The baseline study indicates that Somalia has developed a foundational structure for implementing OH, encompassing education and training, research and innovation, governance and policies, and practical implementation. However, capacity gaps exist in all these areas, which require strengthening. While there is some degree of institutionalization, it remains fragmented, and the operationalization of OH is limited due to the absence of cohesive and formalized supportive policies, as well as a lack of long-term internal funding. Despite these challenges, OH has a promising future in Somalia, largely due to the goodwill demonstrated by all engaged stakeholders. To enhance OH implementation in Somalia, the following recommendations are proposed: update the 2017–2021 OH strategy to address current needs; establish coordination structures at federal, state and district levels; develop a capacity development framework for all educational levels; develop and implement OH community engagement strategy; strengthen OH curricula to include soft skills; promote research in priority areas identified by the OH strategy; and foster multidisciplinary collaboration while engaging women and youth in all aspects of OH implementation.

Group Discussion Questions

1. Discuss the challenges encountered in the implementations of OH in Somalia and what strategies could be used to address these challenges.
2. Evaluate the research and innovations in OH found in Somalia and consider if the ongoing research in Somalia in OH addresses the breadth of OH issues and why/why not more work needs to be done to better understand OH in Somalia.
3. What stakeholders are currently involved in OH in Somalia and what additional stakeholders need to be engaged?
4. Discuss how institutionalization of OH in Somalia and challenges that exist to operationalize OH.

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Conflict of interest

The authors declare no conflict of interest.

Further Reading

Abrar One Health Center. Available at: <https://abrar.edu.so/sohc/publications/> (accessed 10 November 2024).

Borama One Health Declaration. Available at: <https://onehealth.amouduniversity.org/> (accessed 22 November 2024).

One Health for Humans, Environment, Animals and Livelihoods (HEAL) program. Available at: <https://www.oh4heal.org/heal/> (accessed 10 November 2024).

Onyango, D., Fascendini, M. *et al.* (2019) *One Health Policy Context of Ethiopia, Somalia and Kenya*. ILRI, Nairobi. Available at: <https://hdl.handle.net/10568/106965> (accessed 20 June 2023).

References

- Adisasmito, W.B., Almuhairi, S., Behraves, C.B., Bilivogui, P., Bukachi, S.A. *et al.* (2022) One Health: A new definition for a sustainable and healthy future. *PLoS Pathogens* 18, e1010537.
- FEWS (2010) Cross-border Livestock Trade Assessment Report.
- Hassan-Kadle, A.A., Osman, A.M., Ibrahim, A.M., Mohamed, A.A., De Oliveira, C.J. and Vieira, R.F. (2023) One Health in Somalia: Present status, opportunities, and challenges. *One Health* 18, 100666.
- IRLI (2023) HORN: Unleashing the Power of Collaboration in One Health Research for the Horn of Africa.
- Mor, S.M., Fascendini, M., Imbach, S., Ayehu, M., Belay, K. and Consortium, H. (2024) Community-designed one health units as a model for integrated service delivery in pastoralist areas of Africa. *One Health Cases* ohcs20240004.
- Mumin, F.I., Fenton, A., Osman, A.Y. and Mor, S.M. (2023) Zoonoses research in Somalia: A scoping review using a One Health approach. *One Health* 17, 100626.
- Osman, A.Y., Mohamed, H., Mumin, F.I., Mahrous, H., Saidouni, A. *et al.* (2023) Prioritization of zoonoses for multisectoral, One Health collaboration in Somalia, 2023. *One Health* 17, 100634.
- Richards, S., Knight-Jones, T., Angombe, S., Becker, J., Bukachi, S.A. *et al.* (2024) Towards institutionalization of One Health in Eastern and Southern Africa. *One Health Cases* ohcs20240007.
- Rist, C.L., Arriola, C.S. and Rubin, C. (2014) Prioritizing zoonoses: A proposed one health tool for collaborative decision-making. *PloS One* 9, e109986.
- Schiffer, E. and Waale, D. (2008) Tracing power and influence in networks: Net-Map as a tool for research and strategic network planning.
- SOHC (2024a) *2nd Somali One Health Conference*. Available at: <https://abrar.edu.so/sohc-conference2024/> (accessed 20 November 2024).
- SOHC (2024b) *Postgraduate Certificate in One Health*. Available at: <https://abrar.edu.so/sohc/pgcert-in-one-health/> (accessed 23 November 2024).
- SOMALIA-UN (2020) Somalia and COVID-19 – Impact and response.
- SOMALILANDCURRENT (2022) Somaliland: Borama Declaration of HORN One Health Initiative.
- WHO (2024) Integrated Disease Surveillance and Response System: A Game Changer in Somalia.