

REDUCING ZOOONOTIC DISEASE RISKS

IN TANZANIA'S GAME MEAT INDUSTRY: DEVELOPING A ONE HEALTH APPROACH TO VALUE CHAIN MANAGEMENT

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INTRODUCTION AND BACKGROUND

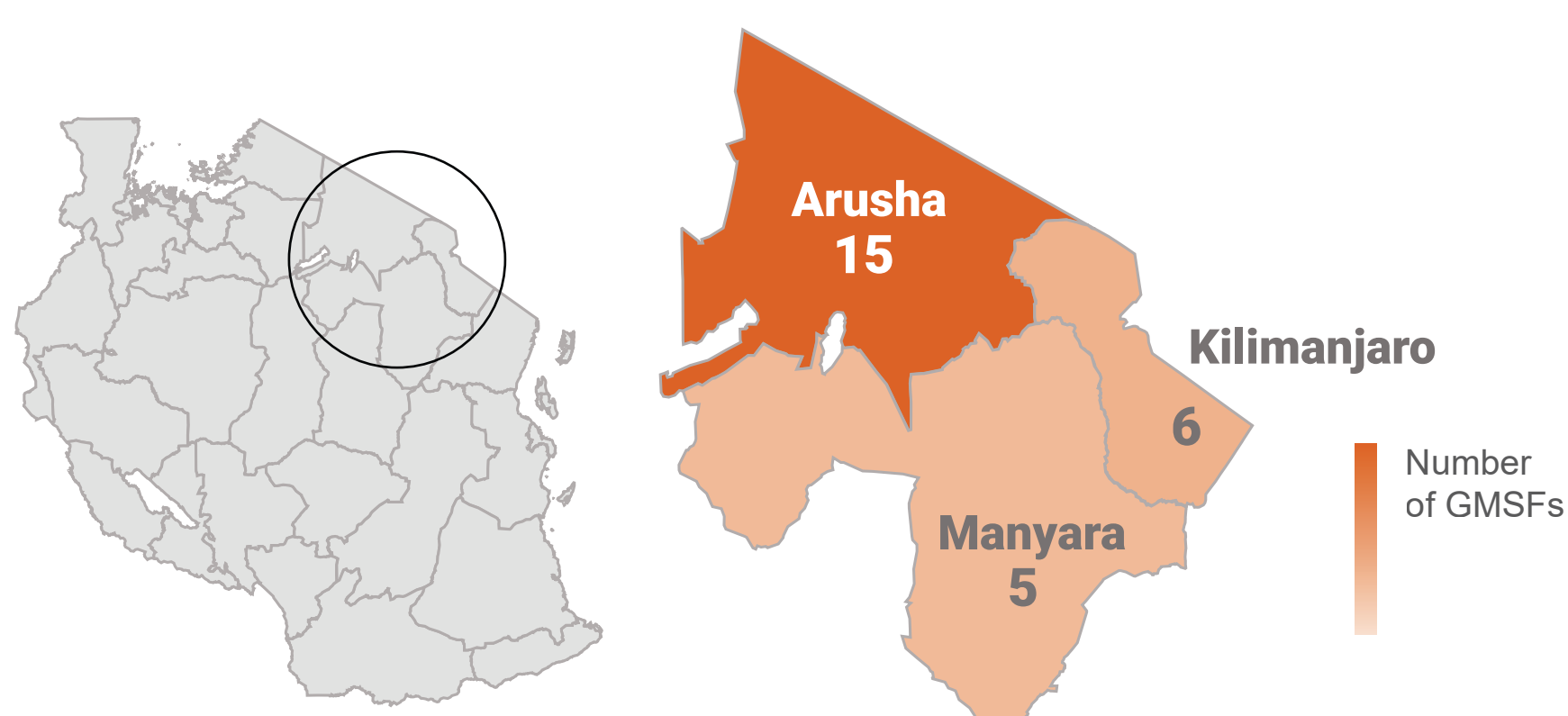
Wild animal trade involves multiple human-animal-environment interfaces between source and end-use, with some taxa more associated with potential for cross-species transmission of pathogens between human, livestock and wildlife populations, which may include spillover. Identifying risk management interventions at critical control points in wildlife trade systems is paramount to improving governance effectiveness, managing risks, and optimise solutions.

In Tanzania, the national Game Meat Selling Regulations enacted in 2020 framed the legal conditions for wild animal meat trade, creating challenges and opportunities to ensure legality, in tandem with sustainability and safety. TRAFFIC, a wildlife trade specialist NGO, worked with the Tanzania Wildlife Management Authority (TAWA), the Directorate of Veterinary Services (DVS) and the Tanzania Wildlife Research Institute (TAWIRI) to evaluate risks in the rapidly developing game meat industry over the period 2021-2024.

METHODS

Within Tanzania, the northern region was chosen for study because of the prevalence of registered game meat selling facilities (GMSFs) within the context of free-ranging wildlife populations, pastoralism, tourism and trans-boundary landscapes.

GAME MEAT SELLING FACILITIES BY SURVEYED ADMINISTRATIVE REGION IN NORTHERN TANZANIA



A value chain analysis (VCA) was conducted to characterise the structure of the game meat trade connecting to Arusha as a major urban centre of wild meat demand and mapping actors, government agency mandates and types of practices and human behaviours.

This VCA informed a qualitative disease risk analysis (DRA) conducted in collaboration with representatives from district-level wildlife, animal health and public health authorities, along with national One Health focal points to prioritise zoonotic diseases and estimate risks associated with traded wild animal taxa. The Hazard Analysis and Critical Control Points (HACCP) approach was an additional reference point for the adaptation of a systems-based approach to effective risk management in Tanzania's game meat trade

Project results were provided to the national multi-agency Game Meat Selling Advisory Committee (GMSAC) to consider risk management measures: strengthening policy and regulatory frameworks; developing standard operating protocols; improving inter-agency compliance and enforcement to enhance governance towards ensuring legality; sustainability and safety in the game meat industry.



CONCLUSIONS

Adapting HACCP approaches from the food safety sector was shown to be extremely practical in structuring a systems-based VCA approach to map the game meat trade and identify critical control points for risk management. This VCA mapping, complemented by the qualitative DRA to prioritise diseases and transmission pathways, allowed for stakeholders to visualise roles and responsibilities to improve governance and compliance standards.

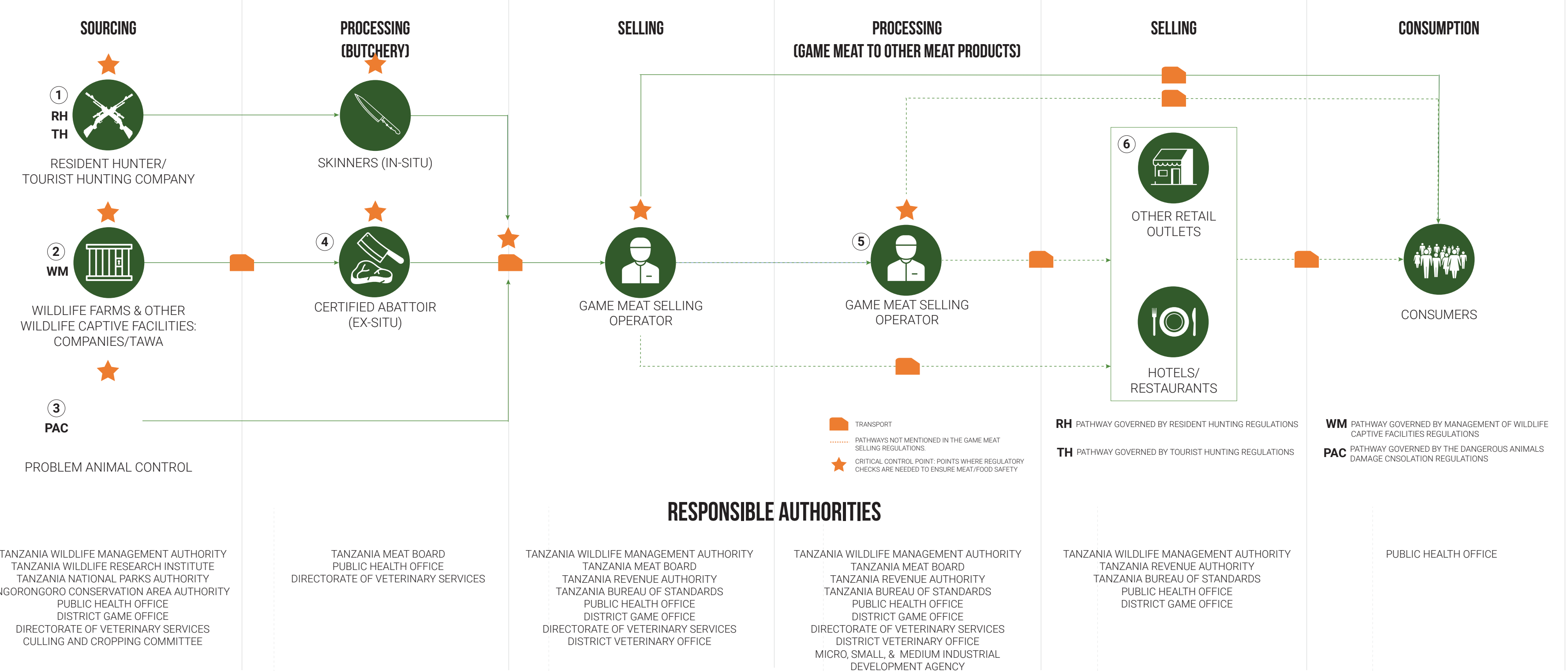
For the game meat industry to further develop, an integrated risk management approach will be essential – meeting criteria to ensure legality, sustainability and safety.

The role of the GMSAC has been critical to build bridges between government and the private sector. This committee, convened by the Ministry of Natural Resources and Tourism, will continue to be a key driver for prioritising management interventions, resources and engagement of relevant stakeholders.

Including wildlife trade into the national approach to One Health can help Tanzania ensure that associated disease risks can be adequately managed as the game meat industry develops. In parallel, efforts to target human behaviour linked to unsustainable, unsafe and illegal harvest, trade, and use of wildlife can also benefit from a multi-sectoral approach to support One Health outcomes.

RESULTS AND KEY OUTCOMES

A VALUE CHAIN ANALYSIS OF TANZANIA'S WILD MEAT SUPPLY CHAIN



1 IDENTIFICATION OF PRIORITY ZOOONOTIC DISEASES

Anthrax, rabies, brucellosis, Rift Valley fever, and bovine tuberculosis were identified by the DRA as priority zoonotic diseases present in northern Tanzania. With specific reference to the game meat supply chain, the three most important diseases (in descending order of importance) were ranked as: Anthrax, Brucellosis and Rift Valley fever virus. Unstandardised and irregular practices in the game meat trade were likely to increase the risk of human exposure to these three priority hazards, as well as unknown or less studied pathogens.

Table 1 (left) Combined scores for identified wildlife-associated zoonotic diseases for all the six study districts. The disease with the highest score across districts is then given an overall rank of number one, the disease with the lowest score is given the lowest overall rank, and so on. (Source: Mdetele et al., 2024, <https://doi.org/10.14202/IJOH.2024.91-99>)

Table 2 (right) Probable zoonotic disease transmission routes between wildlife and humans; domestic animals and humans; wildlife and domestic animals, showing potential for direct and indirect pathways along the wild meat value chain. (Source: Mdetele et al., 2024).

Zoonotic disease	Overall scores (reversed ranks) for each district							Importance (rank)
	Arusha	Siha	Babati	Monduli	Moshi	Simanjiro	Sum	
Anthrax	4.5	4	5	8	5	5	31.5	1
Rabies	4.5	3	4	9	4	3	27.5	2
Brucellosis	2.5	2	2	6	1	3	16.5	3
Rift Valley fever	0	0	0	7	0	3	10	4
Bovine tuberculosis	2.5	1	1	3.5	0	1	9	5
Human African trypanosomiasis	0	0	0	5	0	0	5	6
Porcine taeniasis	1	0	0	3.5	0	0	4.5	7
Leptospirosis	0	0	0	1	2.5	0	3.5	8
Yersiniosis	0	0	3	0	0	0	3	9
Salmonellosis	0	0	0	0	2.5	0	2.5	10
Sparganosis	0	0	0	2	0	0	2	11

Zoonotic disease	Probable routes of transmission		
	Wild-Human	Domestic-Human	Wild-Domestic
Rabies	Bites, contact with saliva on bruised skin	Bites, contact with saliva on bruised skin	Bites
Anthrax	Ingestion (meat), direct contact, inhalation	Ingestion, direct contact, inhalation	Ingestion through contaminated pasture (herbivorous) and carcass
Brucellosis*	N/A	Ingestion of undercooked meat and milk	Ingestion through contaminated pasture (herbivorous)
Bovine tuberculosis*	N/A	Ingestion of undercooked meat and milk	N/A

2 INCREASING INTER-AGENCY COLLABORATION

TRAFFIC revisited officials working at district level and confirmed an increase in inter-agency collaboration on wild meat trade management between local public health, veterinary health and wildlife departments as a consequence of the DRA workshop. Monthly district-level meetings now share information which can help optimise early detection and interventions on illegal, unsafe, and unsustainable wild meat trade, thus demonstrating One Health in action.

3 STRENGTHENING MEAT INSPECTION REGULATIONS

Governance has been improved by including wild animal meat into meat inspection regulations and Standard Operating Procedures for training and certification of game meat inspectors. Amendments to Tanzania's meat inspection regulations were drafted with the assistance of the project team, expanding inspection mandates to include wild animal meat. These regulations were updated with inputs from wildlife, public health, veterinary and private sector, including hunters, hunting companies, wildlife farmers and GMSF operators. Once gazetted, the regulations will enable meat inspection prior to GMSF retail and public consumption.

4 PRIVATE SECTOR ENGAGEMENT

The private sector's involvement in the development and establishment of the industry was previously limited. The project facilitated the involvement of registered game meat selling industry participants, including hunters, traders, farmers and retailers via the Tanzania Wildlife Farmers and Game Meat Sellers Association (TAWIFAGAMSA), to engage with the Game Meat Selling Advisory Committee. This has improved the understanding of regulatory requirements for compliance and overall stakeholder responsibilities.

5 OPERATIONALISING A ONE HEALTH APPROACH

Working with GMSAC raised the issues faced by the game meat industry to the attention of Tanzania's national One Health Desk, which sits under the Prime Minister's office. The project has highlighted the importance of including the wild meat trade into Tanzania's National One Health Strategic Plan (2022-2027) to leverage this existing framework to help conserve biodiversity while safeguarding public health. Wider engagement to highlight Tanzania's game meat trade was done with the East Africa Community Annual Partners Forum on One Health, and via the International Alliance Against Health Risks in Wildlife Trade.

