COUNTY GOVERNMENT
OF WAJIR

2018

MAPPING
PRIORITY LIVESTOCK
DISEASES IN WAJIR COUNTY

ACKNOWLEDGMENTS

The report is the culmination of collaboration between the consultant, Dr. Pauline Gitonga and veterinary staff from the Department of Agriculture, Livestock and Fisheries (DALF) in Wajir County. The consultant expresses her sincere gratitude to the field team composed of Chatsi Omar, Noor H. Abdille, Adan R. Hassan, Hussein Ali, Dr. Abukar Daud and Dr. Luke Kamau. The consultant also recognizes the dedicated service offered by Elijah Lwevo during the inception phase of the study. The consultant is also grateful to all who facilitated timely release of resources to support the study, my gratitude goes to CEC Yusuf Gedi, CO Abdullahi Ragow, CDVS Dr. Kiprono and Bernard Otieno Ouma.

DISCLAIMER

The Wajir County livestock disease mapping report was prepared by Dr. Pauline Gitonga. The opinions expressed in this report are solely those of the consultant and do not constitute in any way the official position of Wajir County Government or the Swiss Agency for Development and Cooperation (SDC).

EXECUTIVE SUMMARY

A participatory epidemiological (PE) study was conducted with livestock keepers in Wajir county between November 2017 and April 2018. The study aimed at mapping priority livestock diseases in camel, goats, sheep and cattle. Data collection involved 48 Focus Group Discussions (FGDs) in 16 sites spread across Wajir county. PE Methods used included simple ranking, pairwise ranking, matrix scoring and proportional piling as well as participatory resource mapping. The results of pairwise comparison identified Haemorrhagic Septicaemia (Qharir), CamelPox (Furuq), Trypanosomiasis (Dukan), Contagious Skin Necrosis (Ma'ah), Camel sudden death syndrome (Fitiq/Risasi) and Pneumoniae (Dugutu) as priority camel diseases in Wajir County. Morbidity rate for haemorrhagic septicaemia and pneumonia was 50 and 52% respectively. Indicating that the most important diseases in camels were those that had respiratory involvement. Contagious Caprine Pleuropneumoniae CCPP (Hoyale), Sheep and Goat Pox (Furuq), Peste des Petits Ruminants (Diftheer), Abortion (Diis) and Impact/bloat Syndrome (Labalol) were the main diseases identified in sheep and goats. Sheep and goat pox had the highest morbidity rate of 60% while CCPP had the highest mortality rate of 62%.

The study also revealed that abortion and impaction/bloat syndromes in goats and sheep was causing significant losses for livestock keepers in Wajir. The mapping study also revealed that livestock keepers in Wajir were shifting from rearing cattle to keeping more drought tolerant livestock species like goats and camels. The endemic presence of Foot and mouth Disease and Contagious Bovine Pleuropneumoniae was highlighted by an estimated overall county morbidity rate of 64%. This highlights that the county still has significant challenges in controlling important trade sensitive diseases that hinder it from engaging in lucrative international trade.

In conclusion, the mapping study was able to demonstrate the importance of conducting participatory diseased surveillance (PDS). PDS technique involves communities thus making them an integral part of disease surveillance. To this end, the following recommendations are forwarded to Wajir county government through the County

Director of Veterinary Services:

- Strategic treatment and vaccination of identified priority diseases should be instituted;
- County needs to set aside a budget to support PDS especially at the identified disease hot spot areas. To boost surveillance capacity of all DALF veterinary staff, the consultant recommends that staff should receive the full certifiable PE training course that takes two weeks;
- Importance of routine sample taking and laboratory analysis before treatment should be encouraged. DALF veterinary staff require continuous professional developing training to improve their diagnostic capacity;
- County should partner with staff from ministry of health to form a one health task force that investigates and puts in place control and preventive measures for zoonotic diseases such as Brucellosis, Rift Valley Fever, Rabies and Anthrax.

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ACRONYMS

ASALs	Arid and Semi-Arid Lands
CBPP	Contagious Bovine Pleuropneumoniae
CCPP	Contagious Caprine PleuroPneumoniae
CDR	Community Disease Reporter
CEC	County Executive Committee
CO	Chief Officer
DALF	Department of Agriculture Livestock and Fisheries
EP	Ephemeral Fever
FMD	Foot and Mouth Disease
HS	Haemorrhagic Septicaemia
PDS	Participatory Disease Surveillance
PE	Participatory Epidemiology
PPR	Peste des Petits Ruminants
RRA	Rapid Rural Appraisal
RVF	Rift Valley Fever
SGP	Sheep and Goat Pox

1.0 INTRODUCTION

The use of conventional serosurveillance techniques to detect and measure levels of livestock diseases in pastoral areas are often constrained by chronic lack of funding and limited human resource[1]. In recent years, animal health workers and researchers working in pastoral setups have recognised that livestock keepers are knowledgeable about diseases that affect their herds and possess a creative and analytical capacity that can be used to improve disease control and preventive practices. Participatory Epidemiology (PE) methods have been adapted by animal health practitioners and researchers to explore and document this indigenous knowledge held by communities so as to better understand local livestock disease situation[2]. Participatory epidemiology (PE) is defined as the systematic collection of livestock disease information from livestock keepers through the use of Rapid Rural Appraisal (RRA) techniques. RRA approach is a bridge between formal research surveys and unstructured research methods. RRA techniques are mostly used to collect livestock disease information in pastoralists systems as these systems often lack information on livestock numbers, disease incidence and geographical location of livestock herds due to the transhumance nature[3] of the system. PE has allowed livestock keepers define and prioritise veterinary-related problems as well as come up with solutions to veterinary service delivery, disease control and surveillance[4]. The persistent occurrence of notifiable diseases in Kenya's arid and semi-arid lands (ASALs) are reported to be the major limiting factor to livestock production systems in the ASALs. Livestock diseases result in direct and indirect economic losses that include high mortality of livestock assets, loss of body weight, milk output and high input cost due to use of chemotherapy agents and vaccinations. In 2015, a study estimated the direct economic losses caused by outbreaks of Peste des petits ruminants (PPR) in Kenya as perceived by Turkana livestock keepers was approximately 19.1 million US$ with mortality of young animals constituting the greatest economic loss valued at 16.8 million US$[5].

1.1 Background Livestock Sector Strengthening (LSS) Project

The Swiss Agency for Development Corporation (SDC) through the Frontier Counties Development Council (FCDC) funded a project entitled Livestock Sector Strengthening (LSS) Project. The LSS project is being implemented by the Department of Agriculture,

[1] C. Byaruhanga et al. / Preventive Veterinary Medicine 122 (2015) 287–297
[2] Catley A., Alders G.R. and Wood L.N.J. (2011). Participatory epidemiology: Approaches, methods, experiences. The Veterinary Journal doi:10.1016/j.tvjl.2011.03.010
[3] Transhumance is defined as the pastoralist practice of moving livestock from one grazing ground to another in seasonal cycles.
[4] Angus Cameron (2012). Manual of Basic Animal Disease Surveillance African Union – InterAfrican Bureau for Animal Resources (AU-IBAR)
[5] Kihu, S.M., Gitao, G.C., Bebora, L.C. et al. Pastoralism (2015) 5: 9. https://doi.org/10.1186/s13570-015-0029-6

Livestock and Fisheries (DALF) in Wajir County. As part of the main LSS project outputs DALF requested for support to develop a county specific livestock disease control framework. The framework was developed in 2016 and it will serve as a road map to guide the county in the control of zoonotic and trade sensitive livestock diseases. In order to implement the framework, the status of livestock disease burden in the county is a necessary precondition[6]. However, information on the current status of livestock diseases in Wajir county is not well understood or documented. It is under this context that the County Directorate of Veterinary Services (CDVS) within DALF and with funding from the SDC funded LSS project engaged a consultant to conduct a mapping study that would identify and prioritize trade sensitive livestock diseases in the county. The mapping study begun in November 2017 and was completed in April 2018.

1.2 Study Objectives

Overall objective

To identify and document priority socio economically important livestock diseases in Wajir county.

Specific objective

1. To determine the geographical occurrence, morbidity and mortality rates of priority trade sensitive livestock diseases of camels, cattle, sheep and goats in Wajir County.
2. To develop a field technical manual for DALF veterinary staff that will assist them identify, diagnose and manage the identified priority livestock diseases in Wajir County.

[6] Livestock Diseases Control Framework for Wajir County (2016). A joint publication from the Department of Agriculture, Livestock and Fisheries (DALF) Wajir County and Mohamed Muhumed Yussuf, an Independent Consultant. The publication was funded by the Swiss Agency for Development and Cooperation (SDC) through a grant to the County Government of Wajir.

2.0 MATERIAL AND METHODS

2.1. Study Area

The study was conducted in Wajir County that is located in the North Eastern region of Kenya between latitudes 3° N 60'N and 0° 20'N and Longitudes 39° E and 41° E. The county covers an area of 56,685 square kilometres ($Km^{2)}$ and borders Somalia to the East, Ethiopia to the North, Mandera County to the Northeast, Isiolo County to the South West, Marsabit County to the West and Garissa County to the South. The first County Integrated Development Plan (CIDP) of 2013 to 2017 describes Wajir's landscape as a featureless plain, the county elevations are between 150 meters (m) and 460 m. The average annual temperature is 27.9 °C and the average annual precipitation is 240 millimetres (mm).

The county is administratively divided into eight sub-counties namely Wajir East, Tarbaj, Wajir West, Eldas, Wajir North, Buna, Habaswein and Wajir South. The main livestock species kept are Camels (Somali breed) Goats (Galla breed), Sheep (Black Head Persian) and cattle (Boran breed). The 2009 household census estimated that the county had 1,866,226 goats, ,406,883 sheep, 794, 552 cattle and 533,651 camels. The main water source for major towns of Wajir, Griftu and Buna are shallow wells. Other settlements rely on boreholes and water pans. The county has 14,360 shallow wells, 206 water pans and 98 bore holes.

Water is mainly used for livestock (53%) and domestic use (30%). The county also has a seasonal river, the Ewaso Nyiro river that provides fresh water and serves as an important grazing area for the county's and neighbouring counties livestock herds. The flat nature of the terrain makes the county prone to seasonal flooding during the rainy season. Seasonal swamps together with drainage lines serve as important grazing zones during the dry season and as cultivation zones during the rainy season. The main seasonal swamps are found in Lagbogol and Habaswein areas[7].

2.2 Data collection

The data collection team was composed of DALF veterinary staff in charge of six sub counties and the consultant. Data collection sites were selected by the veterinary staff. Site selection was based on retrospective disease incidence occurrence reports with the sites visited considered hot spot zones for livestock diseases in the county. PE methodological training of DALF veterinary staff team was conducted between 4th and

[7] This section draws information from the following references: Wajir First County Integrated Development Plan 2013–2017 (Wajir County Government, 2013) and the 2009 Kenya Population and Housing Census (Kenya National Bureau of Statistics, 2010).

7th December 2017. The training consisted of theory in-class training and practical field based training at Lanbib area in Wajir East. Data was then collected between November 2017 and April 2018 using PE techniques as described by Catley et al. (2012)[8]. Data collection tools consisted of Focus Group Discussions (FGDs). At each data collection site three (3) FGDs were conducted. The 3 FGDs separately discussed disease occurrence in the target livestock species that is Camel, Cattle, sheep and goats. Six PE techniques were used;

1. Participatory Natural Resource mapping,
2. Simple Ranking
3. Pair wise ranking
4. Matrix Scoring
5. Proportional pilling,

FGD discussions with participants were conducted in the local language and all team members were involved in conducting the 3 FGDs at each site. FGDs were conducted in the mid-morning with discussions taking an average of 120 minutes. The data collection team ensured they cross checked responses by ensuring they probed to verify information that was contradictory. The team also ensured that all members of the FGD expressed their opinions and that discussion was open and not dominated by one or a few individuals. The FGD participants were also given time to discuss and reach a consensus. The PE methods of using stone counters (30 stones to represent the whole herd) was used to rank and score disease incidence rate for diseases). Ranking and scoring was done on flip charts while the resource maps was first drawn on a cleared ground using locally available materials and later sketched onto a manila paper (Figure 3). After the morning data collection session, the team met in the afternoon to review notes and write a Participatory Disease Surveillance (PDS) report.

The report was forwarded to the County Director of Veterinary Services (CDVS) for documentation purposes and in some instances where there were unusual disease outbreaks or syndromes reported. The CDVS requested the county government to support the team to carry out further investigation and treatment. Data collected was entered into a spread sheet (Microsoft Excel 2013) and analysed for descriptive statistics that included averages, frequencies and proportions (morbidity, mortality and case fatality rates). The data was presented in tables, bar graphs and pie charts.

[8] Catley, A., Alders, R.G., Wood, J.L., 2012. Participatory epidemiology: approaches, methods, experiences. Vet. J. 191, 151–160.

The following disease incidence rate formulas were used;

$$\text{Morbidity rate} = \frac{\text{Number of animal sick}}{\text{Total Number of animals in herd}}$$

$$\text{Mortality rate} = \frac{\text{Number of animals that die}}{\text{Total Number of animals in herd}}$$

$$\text{Case fatality rate} = \frac{\text{Number of animals that die}}{\text{Number of animals sick}}$$

3.0 RESULTS AND DISCUSSION

The mapping study was conducted in 16 sites distributed across the 8 sub counties of Wajir (Figure 1). A total of 48 FGDs (3 FGDs in each site) were conducted with a total of 565 participants with an average of 35 participants per site (Figure 2). Majority (72%; n=409) of participants were men. In most pastoralists communities livestock assets are owned by men this is especially so for the large ruminants (Camel and Cattle). Women are largely involved in rearing small stock (Sheep and goats) and they sometimes own small ruminants[9].

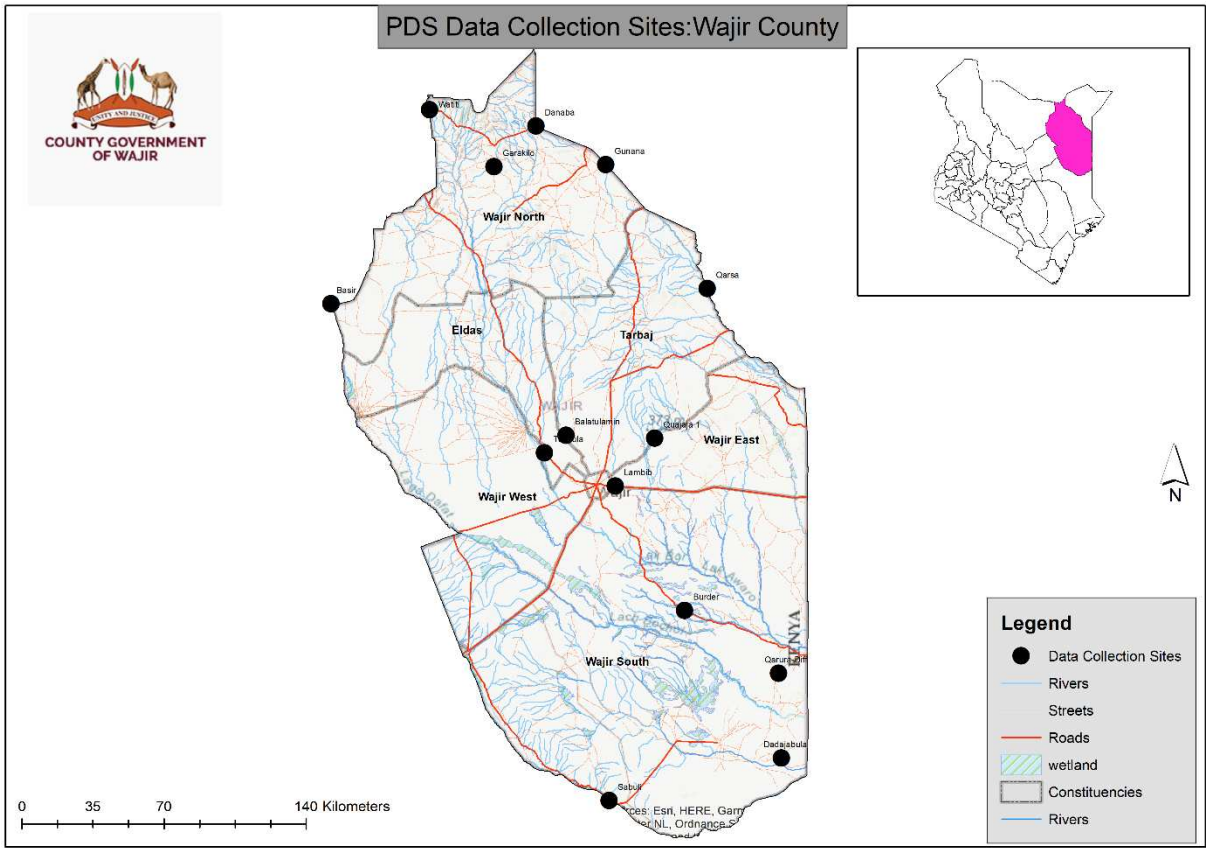


Figure 1: Map showing distribution of data collection sites

[9] P N Gitonga, C K Gachene, E Njoroge and S M Thumbi (2016). Small ruminant husbandry practices amongst Kajiado and Marsabit pastoralists and their effects on Peste des petits ruminants control strategies. Livestock Research for Rural Development 28 (2).

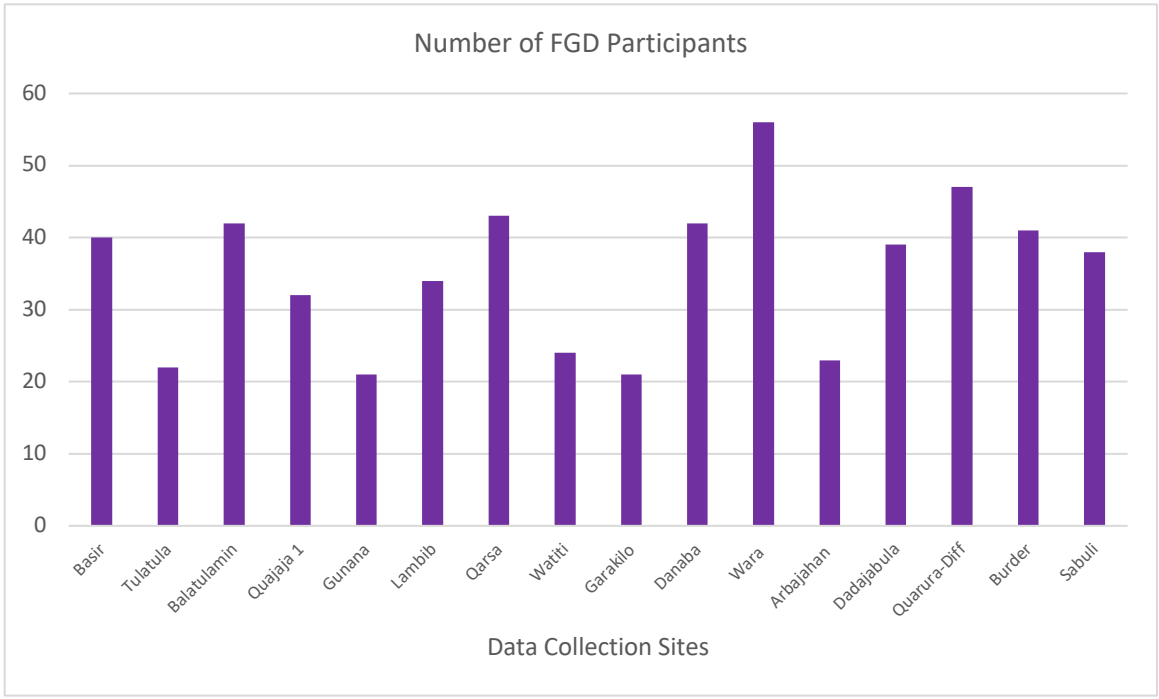
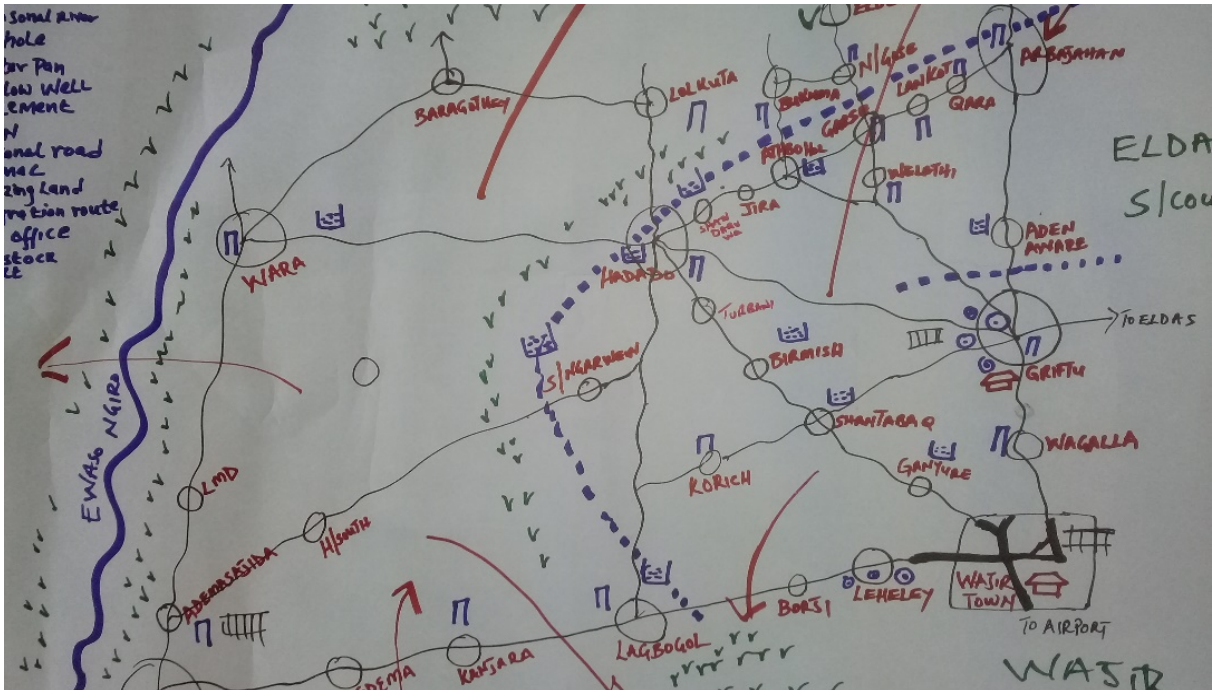


Figure 2: Number of FGD participants in each data collection site

3.1 Participatory Mapping

The overall objective of the participatory mapping was to enable the livestock keepers and DALF veterinary staff document knowledge of their local environment that is excluded from mainstream documents or official maps. The developed community maps sketched on manila paper were then converted to digital format.

Figure 3: Community Sketch Map of Wajir West



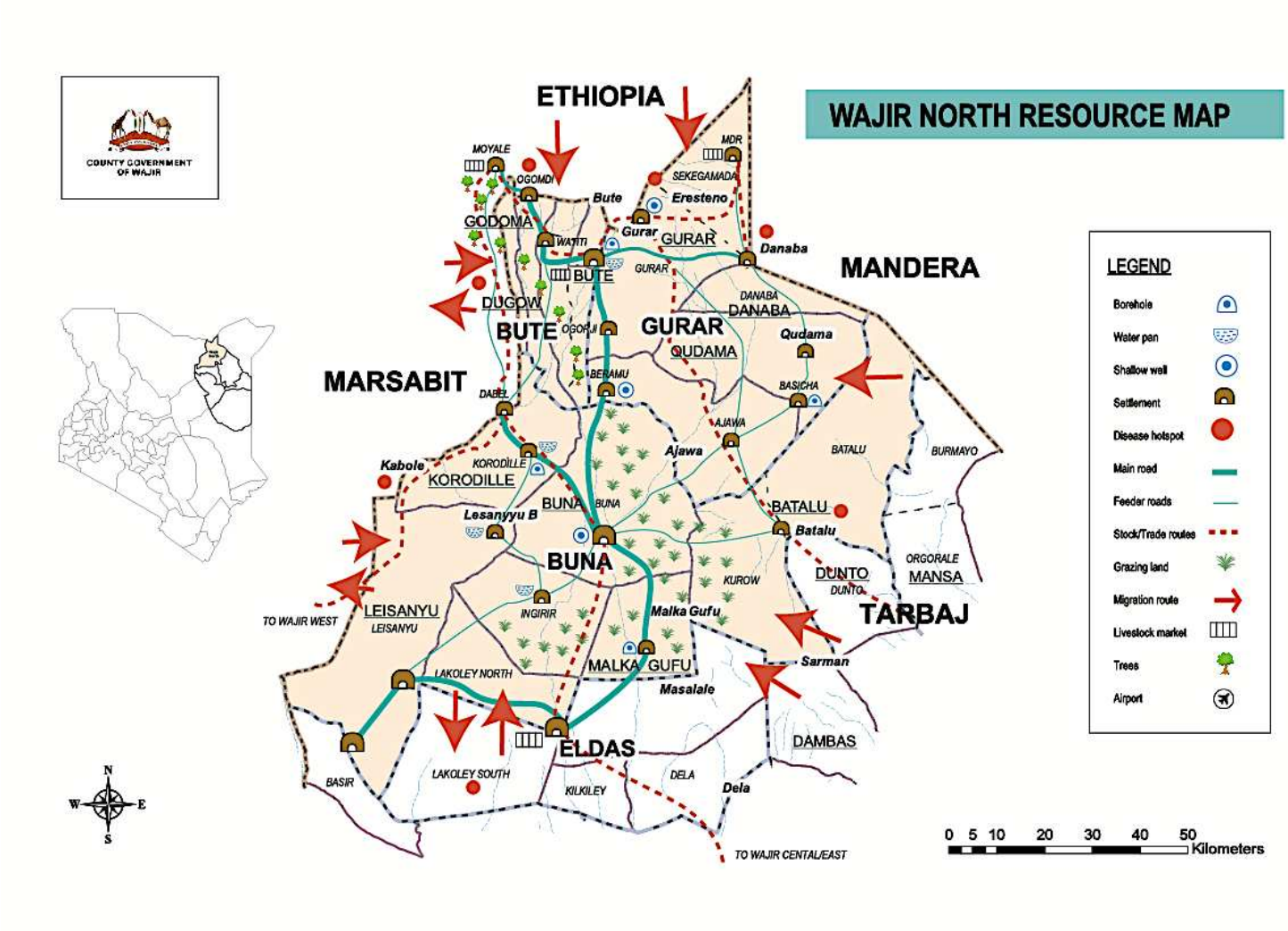


Figure 4: Wajir North Digital resource map

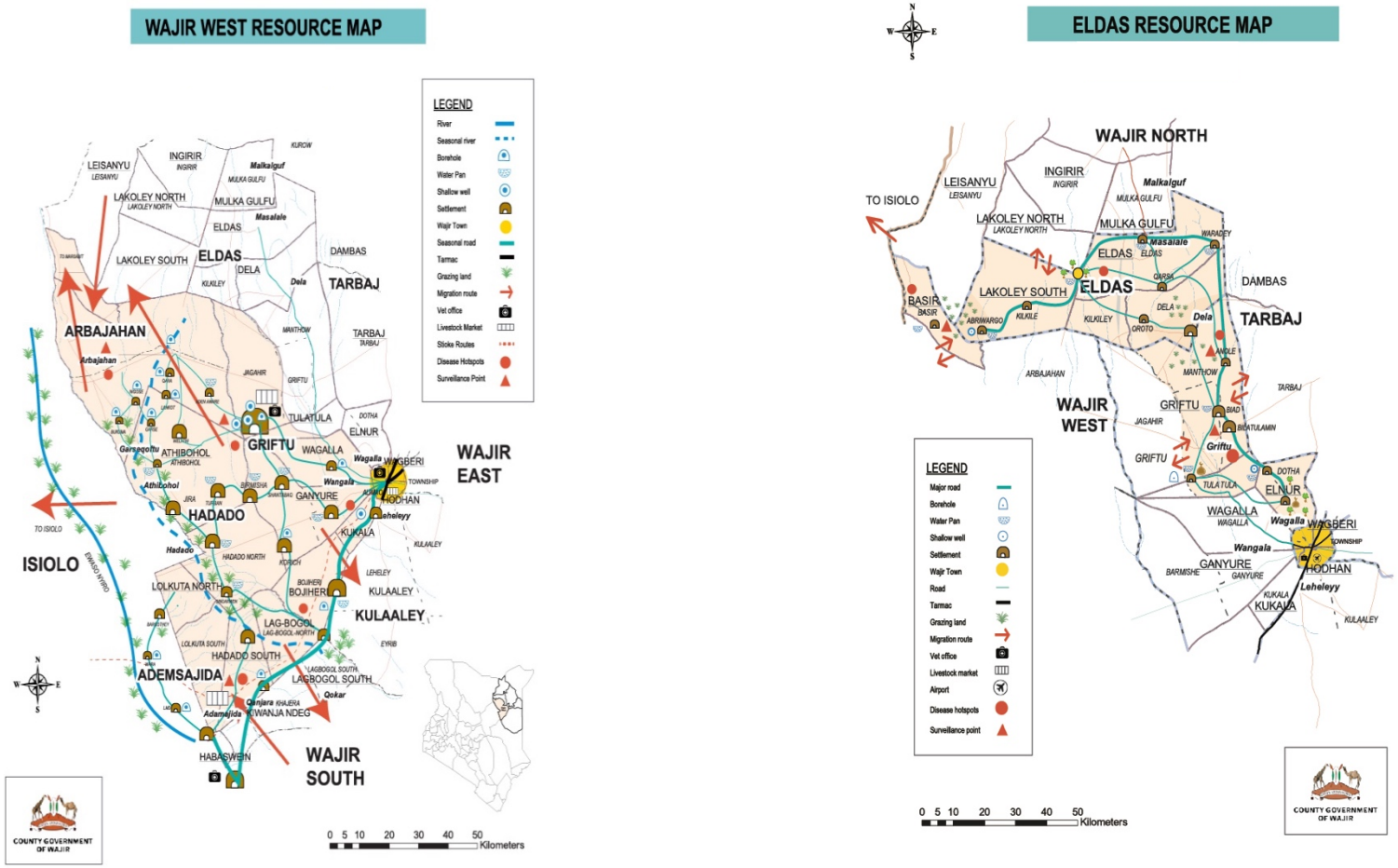


Figure 5: Wajir West and Eldas digital resource map

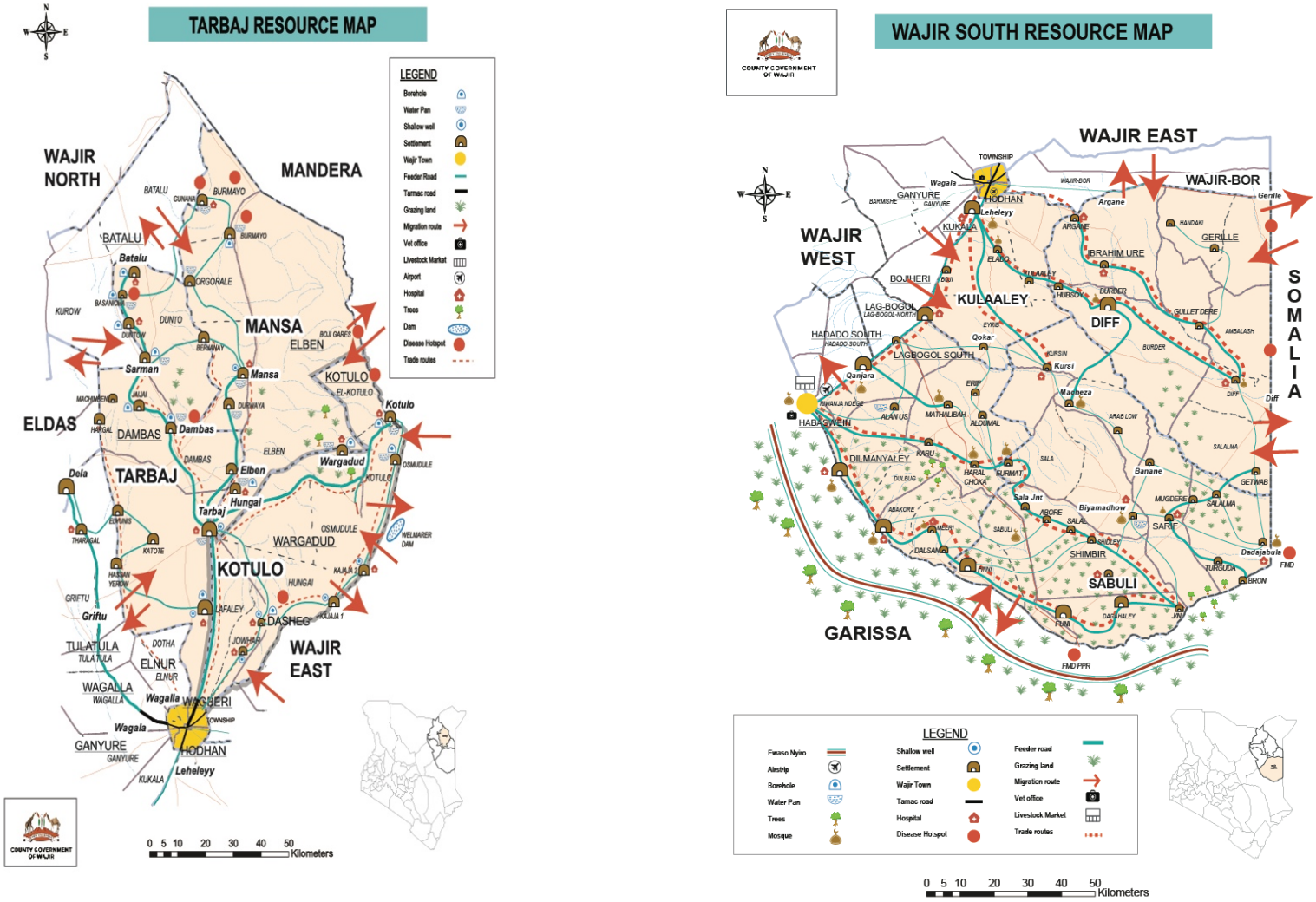


Figure 6: Tarbaj and Wajir digital resource maps

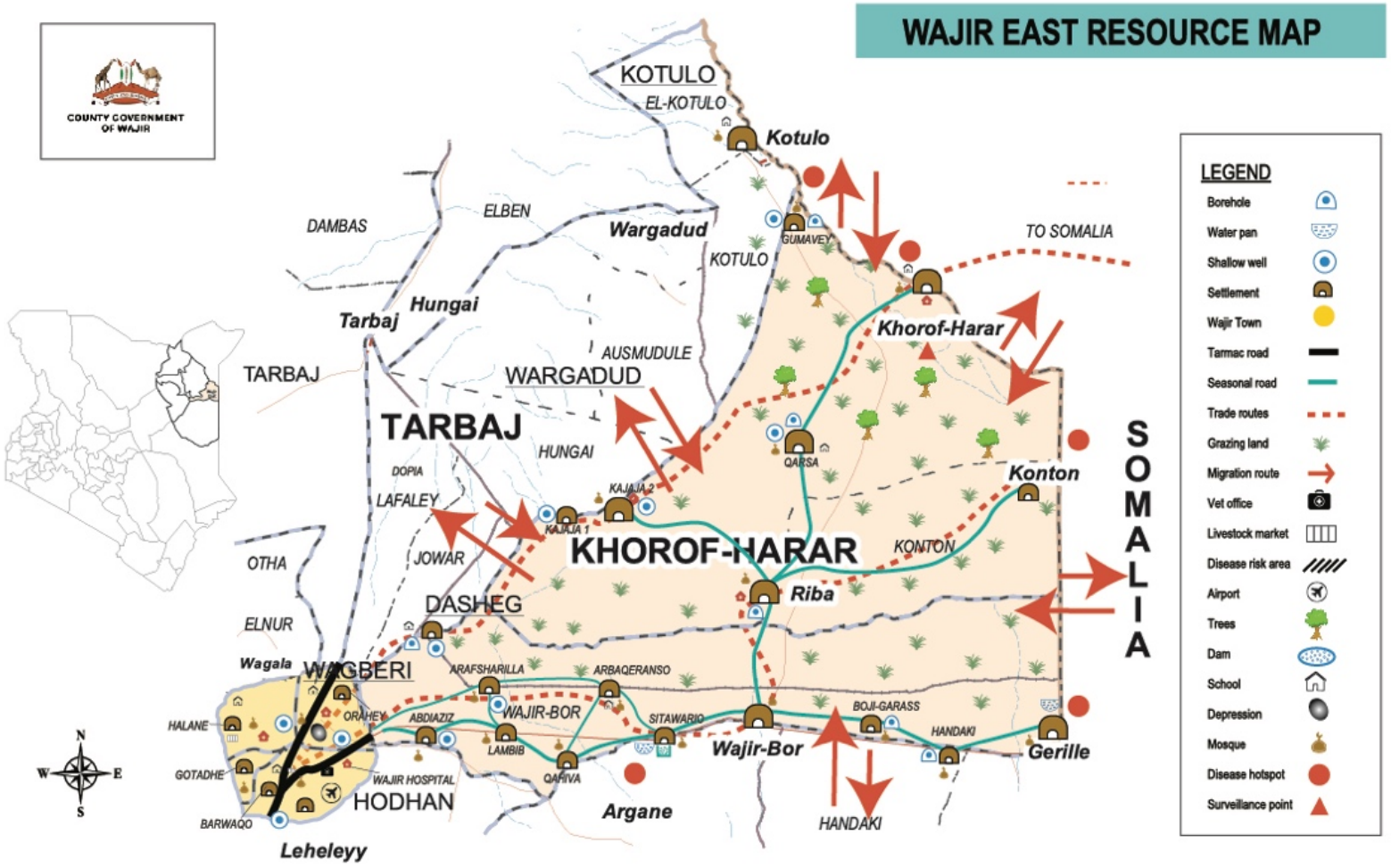


Figure 7: Wajir East digital resource maps

The participatory maps revealed the following;

- There is extensive intra and inter county movement of livestock making disease containment during outbreaks difficult.
- Livestock movement is mainly in search of grazing resources. The maps demonstrate that ideal grazing lands are found in Wajir North, Wajir East and in the southern parts of Wajir South near the Ewaso Nyiro river belt.
- There is high human settlements in Wajir but more so for Wajir West, Eldas and Tarbaj sub counties. This may be the reason these areas have diminishing grazing areas.
- Hot spot areas were identified and they were mainly associated with watering points, especially shallow wells and boreholes or livestock market or inter county/country boundary routes.
- The disease hot spot areas located at inter county or intra county/country boundaries were jointly earmarked by livestock keepers and veterinary staff as ideal areas to set up disease surveillance points. These areas are listed below;

Proposed international border surveillance points;

a) Somalia- Kenya border- Diff, Dadajabula in Wajir South and Konton, Khorof Harar in Wajir East
b) Ethiopia- Kenya border- Bute, Gural and Moyale in Wajir North

Proposed Intra and inter county borders

i. Kotulo, Burmayo and Sarman in Tarbaj
ii. Sabuli in Wajir South
iii. Wair town in Wajir East
iv. Korandille and Watiti in Wajir North
v. Basir and Anole in Eldas
vi. Abajahan, Ademasaida and Griftu in Wajir West

3.2 Simple and Pair-wise Ranking

The 48 FGDs were verbally asked to name in order of importance which species they felt were of the greatest economic importance. 45 out of the 48 FGDs ranked Goats as the most important specie, followed by camels, sheep and lastly cattle. This ranking is a reflection of the response of livestock keepers to the changing status of climate and vegetation dynamics. Wajir county being predominately arid has experienced prolonged drought the last one running for close to three years (2015,2016 to 2017). Further, the lack of planned grazing patterns that does not allow rest of rangelands and rehabilitation (reseeding with appropriate grass and forage species) has resulted in many grazing lands

across the county being degraded[10]. This has meant that there is less grass for cattle and sheep that are exclusively grazers. Range degradation also results in shrub and bush encroachment of grasslands hence favouring browsers like goats and camels. The FGD participants were then asked to list important livestock diseases that caused them the greatest socio economic loss. To do this, the participants discussed amongst themselves and came up with a list of diseases.

Each FGD was then allowed to discuss and reach a consensus on the top 5 diseases they perceived as the most important in their area for each specie. The complete list of all diseases mentioned is attached as annex 1 to this document. The final 5 diseases selected were then subjected to pair wise ranking. During the pair wise ranking the data collection team recorder sketched a 5 × 5 grid on a flip chart paper then used locally available material to represent the 5 diseases. This was important as writing down the names of the diseases alienates participants who cannot read from the discussions. FGD participants were then asked to compare each disease against the others in each specie.

The criteria for comparison were two; Impact on productivity and impact on livelihoods. Pairwise ranking was done by comparing each disease individually with all the other diseases one-by-one (*Figure 7*).

	HS	MASTITIS	POX	ORF	BLOAT
HS		HS	HS	HS	HS
MASTITIS			MASTITIS	MASTITIS	MASTITIS
POX				POX	POX
ORF					ORF
BLOAT					
Numberoftimes elected	4	3	2	1	0

Figure 7: Pair wise ranking of five priority diseases in Wajir county

[10] Wajir County Integrated Development Plan 2013-2017.

The recorder documented the disease that was indicated as more important. The total score (0–5) for each disease in a group was noted. In each FGD the pair wise ranking narrowed the 5 prioritised disease to 3 per specie. To get the overall priority disease in the county, all pair wise ranking scores for the 48 FGDs were subjected to frequency response calculation. The diseases that had the highest mention were then sequentially ranked from 1 to 5. The overall pair wise ranking results for the 48 FGDs are highlighted in the tables below.

Table 1: Priority Camel Diseases in Wajir County

Disease Name	Local Name
1. Haemorrhagic Septicaemia	Qharir/ Qarir
2. Camel Pox	Furuq
3. Trypanosomiasis	Dukan
4. Contagious Skin Necrosis	Ma'ah
5. Camel sudden death syndrome	Fitiq/Risasi
and Pneumoniae	Dugutu/Dugut

Table 2: Priority Goat and Sheep diseases in Wajir County

Disease Name	Local Name
1. Contagious Caprine Pleuropneumoniae (CCPP)	Hoyale / Sombesa
2. Sheep and Goat Pox (SGP)	Furuq/Bagah
3. Peste des Petits Ruminants (PPR)	Diftheer/ Jidhaa
4. Abortion	Diis
5. Impact/bloat Syndrome	Labalol/ Dibir

Table 3: Priority Cattle diseases in Wajir Count\

Disease Name	Local Name
Foot and Mouth Disease (FMD)	Habeb
Ephemeral Fever (EP)	Tunya/Tunyo/ Butalah /butesa
Lumpy Skin Disease	Furuq
Contagions Bovine Pleuropneumoniae (CBPP)	Sombesa/Sambap

3.3 Matrix Scoring

Matrix scoring for the diseases was conducted as described by Catley and Mohammed(1996)[11]. In each FGD the 3 top-ranked diseases for each target specie based on the pairwise ranking, were scored against clinical signs indicators. The diseases were symbolised with materials from the environment and placed along the top x-axis of the matrix and the indicators were illustrated both with written cards and symbols and placed along the y-axis (Figure 8).

Figure 8: Matrix scoring to assess knowledge on disease syndromes

Five participants in the FGD were then randomly selected and given 15 stones each to divide among the indicator cards for each disease. The stones indicating that the disease was associated with the indicator being scored. The number of stones was chosen because five stones per disease should be sufficient to show differences between diseases but not large so as to be difficult to handle or divide. The number of stones allocated to each disease was then counted and recorded. The scoring procedure was repeated until all the indicators had been scored against each disease. The main aim for the matrix scoring was to ensure that livestock keepers could correctly identify disease syndromes for the priority diseases mentioned. Conventional PE matrix scoring requires stones to be counted and subjected to non-parametric statistical procedures to assess frequencies, median, range and level of agreement between FGD groups using Kendall's coefficient of concordance (W). However this was not possible in this mapping study as the PE training due to the short duration of time allocated did not cover this aspect.

3.4 Proportional Piling

Proportional piling was used to estimate the incidence rate that is morbidity, mortality and case fatality rates of the important livestock diseases in the target species. Five FGD participants were randomly selected and given a pile of 30 stones that represented the

[11] Catley, A.P., Mohammed, A.A., 1996. The use of livestock-disease scoring by a primary animal-health project in Somaliland. Prev. Vet. Med. 28, 175–186.

number of animals in a herd. The participant was first asked to divide the stones into two piles representing the proportion of the herd that got sick with the disease when there was an outbreak in the herd and those that remained healthy. The pile representing the proportion of animals that became sick was further sub-divided into 2 piles corresponding to the proportion of animals that survived or died . This activity provided estimates of the incidences rate of each priority disease.

3.4.1 Camel diseases incidence rate

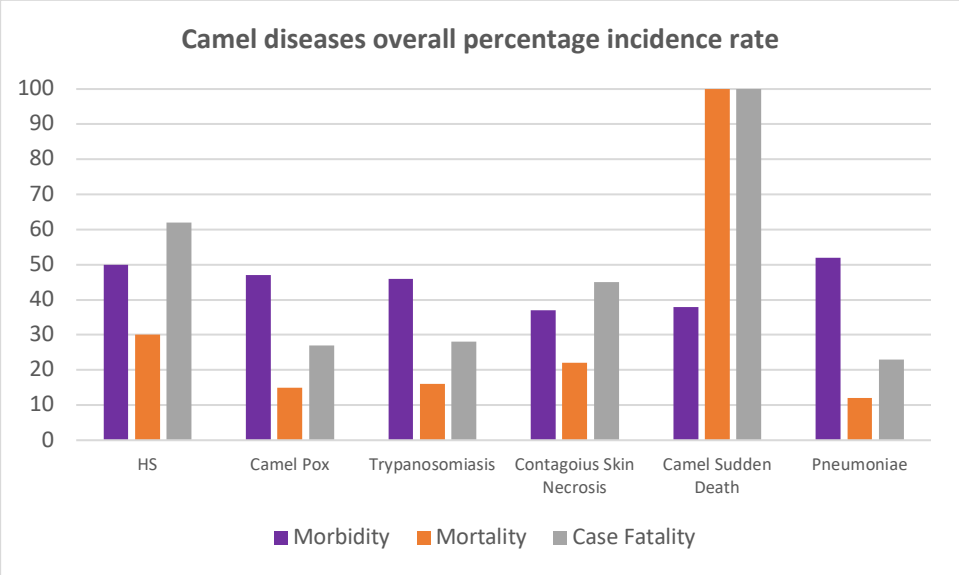


Figure 9: Camel diseases overall incidence rate, Wajir county

Haemorrhagic Septicaemia and Pneumoniae due to viruses (possibly influenza) and other bacteria (other than HS Pasteurella bacteria) had the highest morbidity rates. This means that camel diseases with respiratory manifestations were associated with the highest social economic losses. This findings is similar to documented literature. In a 1999 longitudinal study[12] in Saudi Arabia that collected 514 samples of nasal swabs, tracheal swabs and pneumonic lung tissues from camels that died of pneumonia found that most (460) samples had bacterial isolates with 9 genera of bacteria (82% Gram positive organisms and 15% Gram negative). Staphylococcus aureus and Corynebacterium pyogenes were the most predominant bacterial agents isolated. Most gram positive bacteria were sensitive to penicillin, ampicillin while both gram positive and gram negative bacteria were sensitive to Gentamicin. This study demonstrated the importance

[12] Aetiological study on pneumonia in camel (Camelus dromedarius) and in vitro antibacterial sensitivity pattern of the isolates [1999]. Al-Doughaym, A.M. (King Faisal Univ., Al-Asha (Saudi Arabia). Dept. of Microbiology and Parasitology) Mustafa, K.M. Mohamed, G.E.

of collecting samples to submit for bacterial culture and sensitivity. The geographical distribution of camel diseases in Wajir County is shown in the figure 10 below.

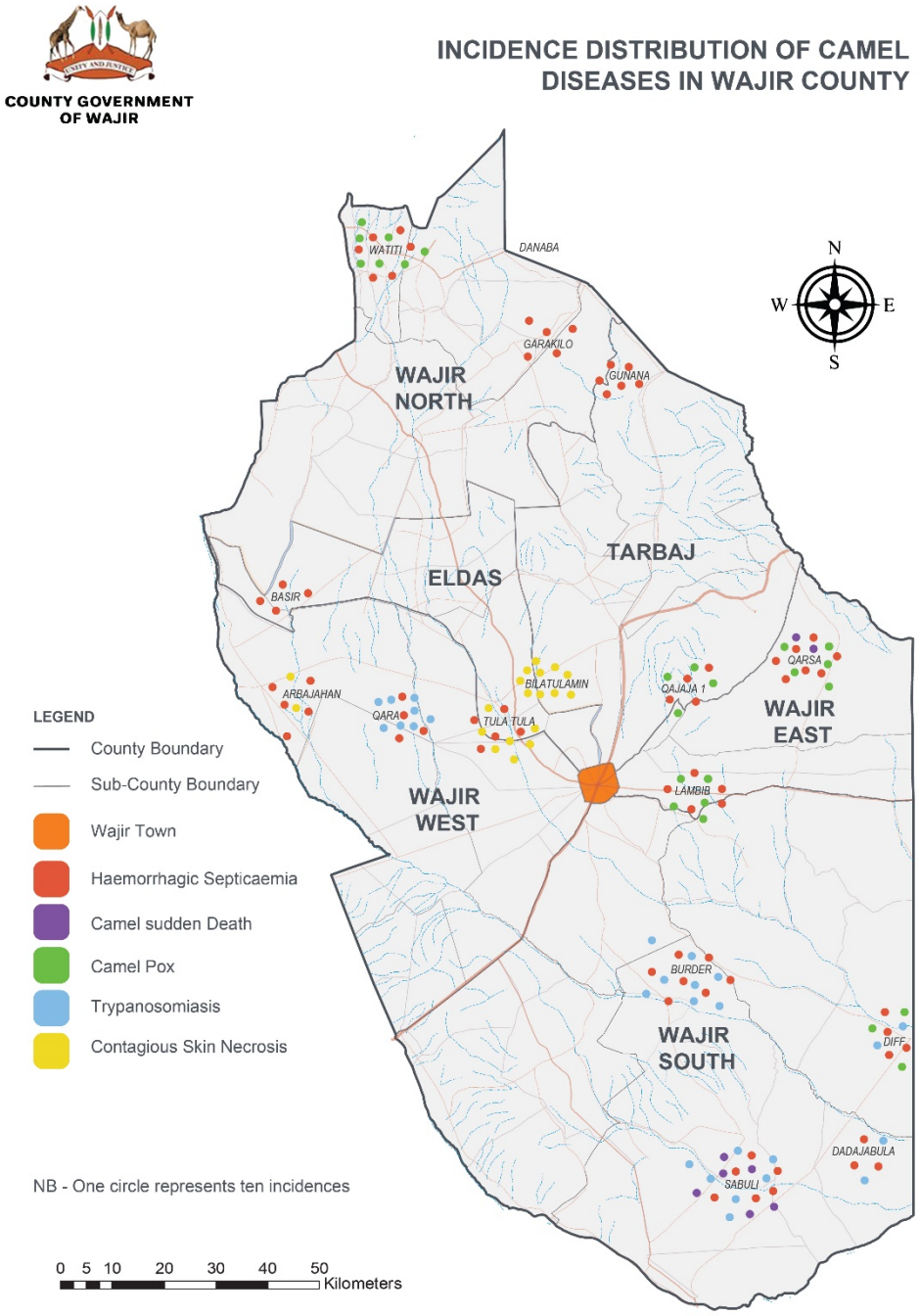


Figure 10: Camel diseases geographical distribution, Wajir County

3.4.2 Goat and Sheep diseases incidence rate

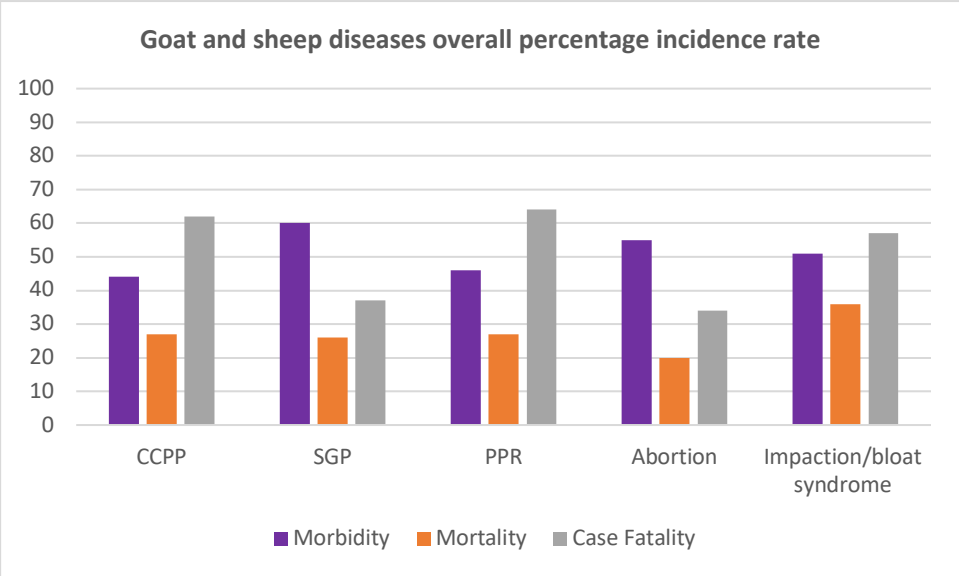


Figure 11: Goat and sheep diseases overall incidence rate, Wajir county

Sheep and goat pox has the highest morbidity rate of 60%, the results reveal why livestock keepers prioritised abortion and impaction bloat syndromes. The two syndromes resulted in a high morbidity and case fatality rates. There is need to investigate the causative agents for these two syndromes in Wajir County. The geographical distribution of goat and sheep diseases in the county are shown in *figure 13*.

3.4.3 Cattle diseases incidence rate

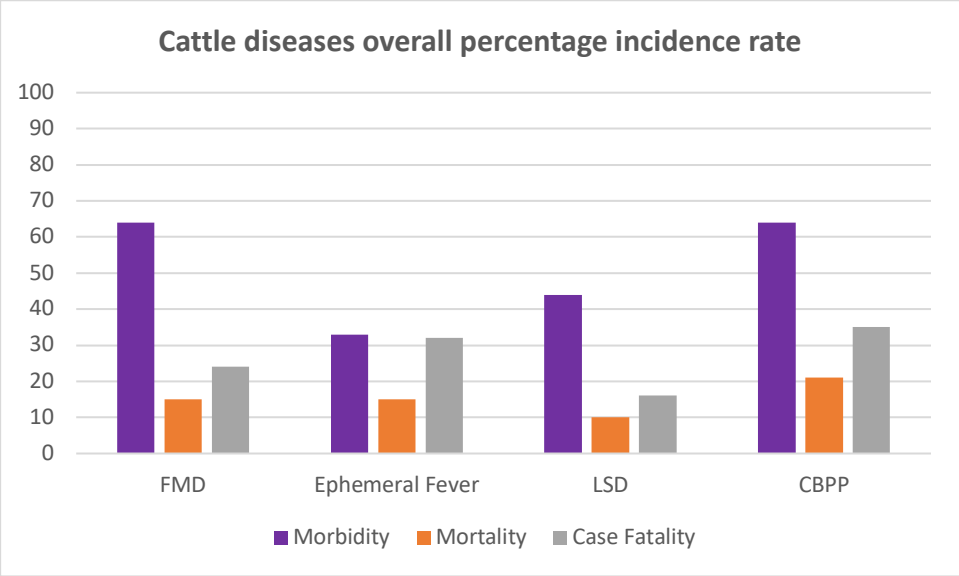


Figure 12: Cattle diseases overall incidence rate, Wajir county

As noted from 45 of the 48 FGD discussions, cattle keeping is beginning to be phased out in response to climate change and degradation of grazing lands. The most important cattle disease was CBPP as it also resulted in the highest mortality and case fatality rates (Figure 12). FMD has a high morbidity rate but a low mortality and case fatality rate and this could be the reason that livestock keepers and veterinary staff do not concentrate on vaccination prevention measures. However, it should be noted that if Wajir county wants to engage in international beef, chevon or mutton carcass or live animal trade FMD control measures need to be put in place. The geographical distribution of cattle diseases is shown in the figure 14 below. It was notable that CBPP was not reported in any site in Wajir South, if this is indeed true, then Wajir South can be zoned off as a CBPP free zone and screening point for cattle destined for the Garissa livestock market or coming into the county.

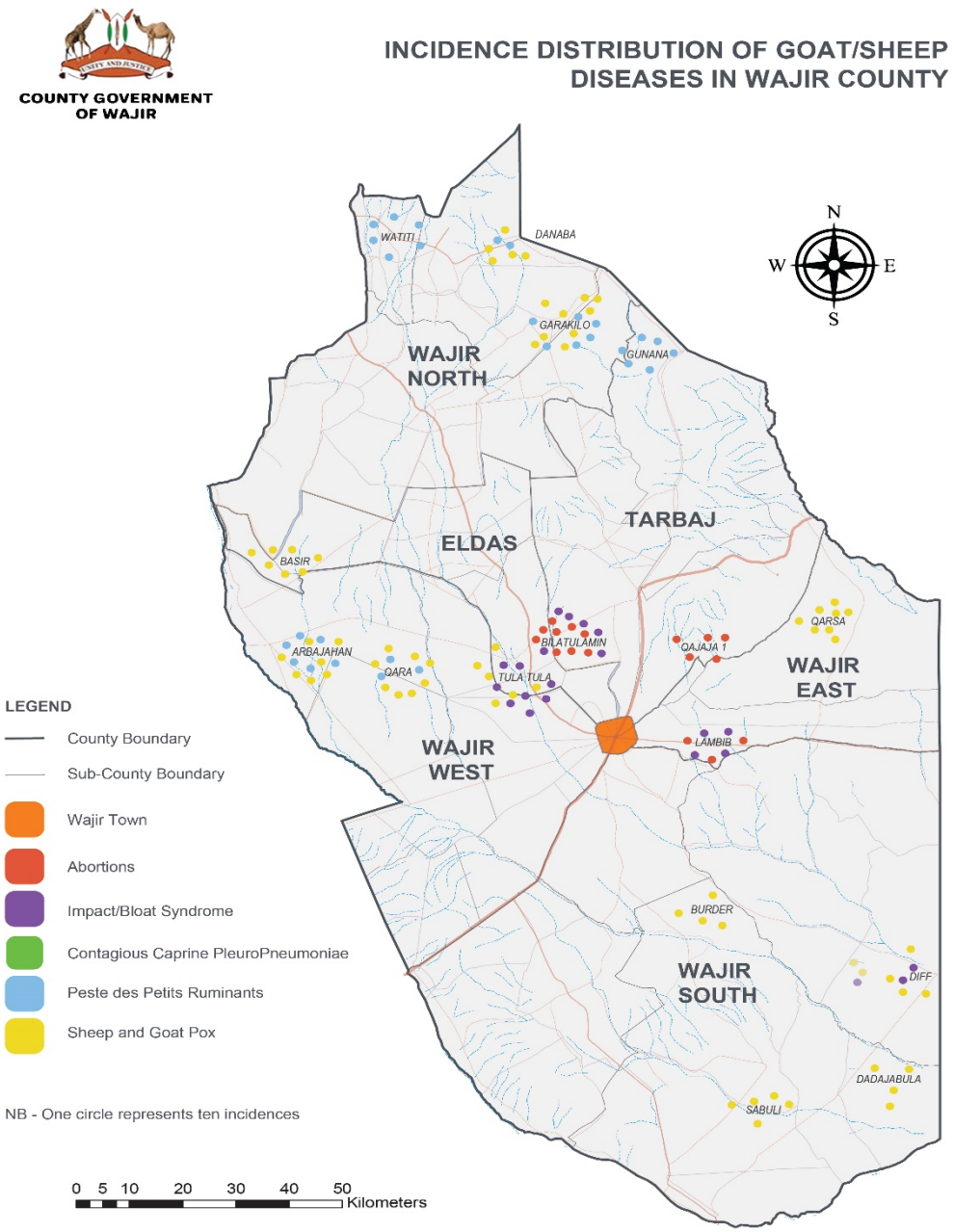


Figure 13: Goat and sheep diseases geographical distribution, Wajir County

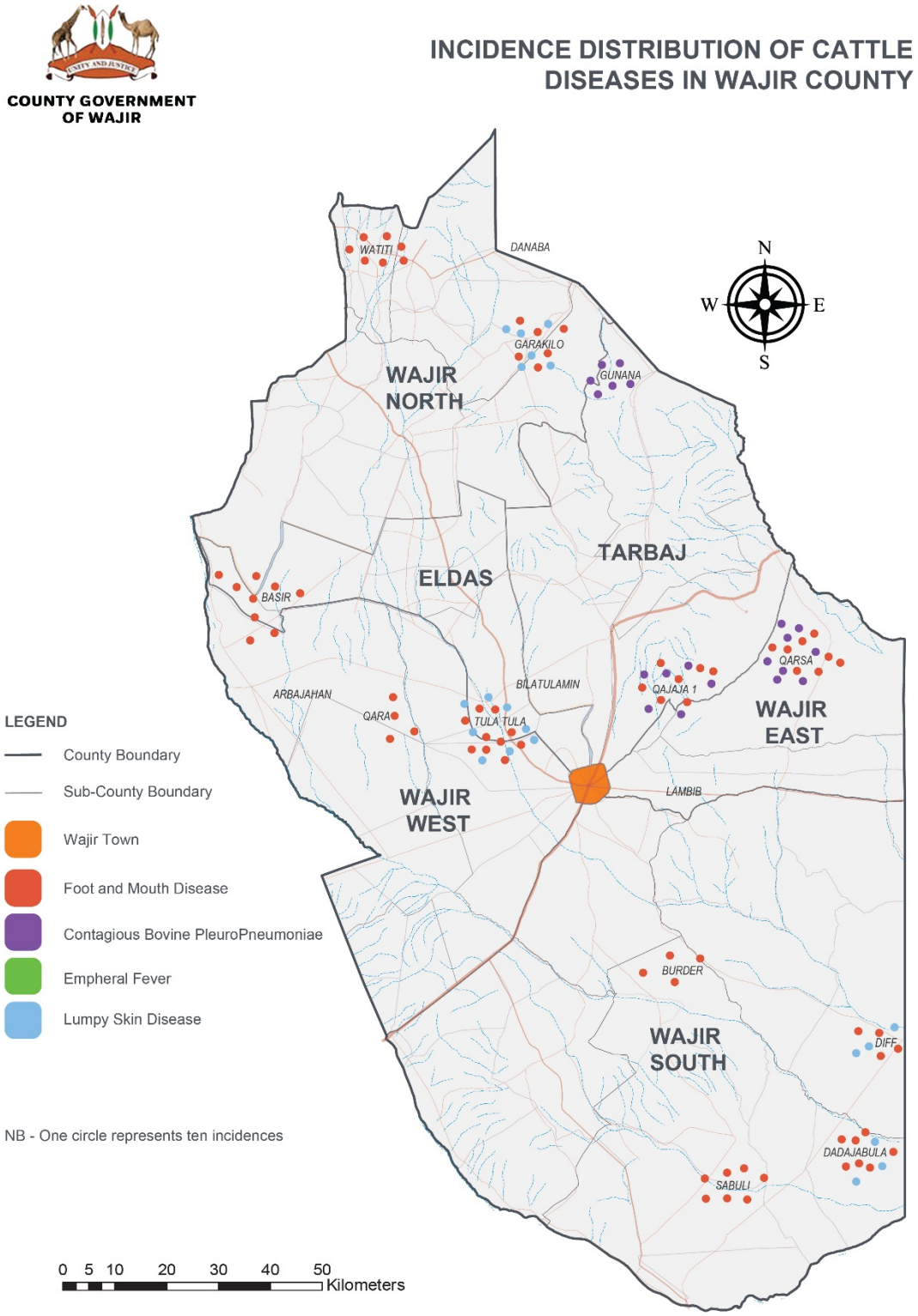


Figure 14: Cattle diseases geographical distribution, Wajir County

CONCLUSION AND WAY FORWARD

Participatory epidemiological tool was able to identify current livestock diseases in Wajir County. Some of the diseases identified such as CBPP, Camel pox, FMD, LSD, CCPP and PPR are classified as notifiable diseases in Kenya and by OIE (see annex 2 for complete OIE list of notifiable disease). The implication of having endemic occurrence of notifiable disease means that the county is officially locked out of international livestock trade opportunities.

The pastoralists also noted that undiagnosed disease syndromes like camel sudden death, abortion and impaction bloat syndrome in sheep and goats was resulting in heavy losses. The mapping study was also able to identify low burden of potential zoonotic diseases, pastoralist complained of fever and joint pains after consuming unboiled milk from female camel and goats that had previous abortion and arthritis syndromes. In Eldas Basir site, the FGD discussion conducted in April 2018 during the heavy rainy season highlighted unexplained high fever in all ages of sheep and goats which they associated with the high mosquitoes population. This community observation could have been the first indication of possible Rift Valley Fever virus multiplication in animals. To this end the following recommendations are forwarded to Wajir county government through the County Director of Veterinary Services;

1. Strategic treatment and vaccination of identified priority diseases should be instituted. Livestock diseases in the county are endemic and occur throughout the year. However, most discussions indicated that most diseases occurred during and after the short and long rainy seasons;
2. The county needs to set aside a budget to support PDS especially at the identified disease hot spot areas. The county should also support action research on investigation, isolation and treatment options on the unknown disease syndromes. The county should leverage on collaborating with the livestock training institute to conduct this research;
3. The importance of routine sample taking and laboratory analysis before treatment should be encouraged. DALF veterinary staff require continuous professional developing training to improve on their diagnostic capacity. This is especially so as the county is making steps to set a Bio Safety level 2 laboratory at the headquarters and a border surveillance point that is equipped with laboratory capacity at Khorof-harar in Wajir East.
4. There is need to train all DALF veterinary staff on PE techniques. The PE course is certifiable and takes a minimum two weeks to attend;
5. The county should partner with staff from ministry of health to form the one health task force that investigates and puts in place control and preventive measures for zoonotic diseases reported such as Brucellosis, Rift Valley Fever, Rabies and Anthrax.

ANNEX SECTION

Annex 1: Complete List of Livestock Diseases in Wajir County

List of Camel Diseases in Wajir County	
Disease name	Local names
6. Haemorrhagic Septicaemia	Qharir/ Qarir
7. Pneumoniae	Dugutu/Dugut
8. Trypanosomiasis	Dukan
9. Helminthiasis	Gorian/Bulal/Lesa
10. Contagious skin necrosis/abscess	Ma'ah
11. Influenza	Hergeb
12. Plant Poisoning	Warerow/ Idhi / Gadala
13. Camel pox	Furuq
14. Tetanus	Mathahatay/ Taqow/ Othurgir
15. Skin allergic reaction	Dula
16. Mastitis	Gurdu/ Candabarer
17. Brucellosis	Hebnaqabat
18. Wry neck	Shimbir / Guthan
19. Abortion	Diis
20. (unknown)Pain, swollen feet and fever with occasional abortion	Lahaugel
21. Ring worms	Anfar / Canfar
22. Rabies	Nikis/Siiq
23. Heart water	Uthle
24. Orf	Anmbarur
25. Bloat	Dibir
26. Camel Sudden death Syndrome	Risasi/ Habat
27. Abscess	Burumal

List of Sheep and Goat Diseases in Wajir County	
Disease name	Local names
1. Sheep and Goat Pox	Furuq/Bagah
2. Contagious ecthyma (Orf)	Cambarur / Amburur
3. Contagious Caprine Pleuro Pneumoniae	Gesdow/ Sombesa
4. FMD	Hoyala
5. PPR	Diftheer/ Jidhaa
6. CCPP	Hoyale
7. Abscess	Burumal
8. Abortion	Diis
9. Foot rot	Rafqari /Hokol

10. Mastitis	Candabarar
11. Papilloma warts	Korofey
12. Mange infestation	Cadah
13. Plant poisoning	Gadala
14. Fever	Qanda
15. PPR	diftheer
16. CCPP	Hoyale
17. Abscess	Burumal
18. Abortion	Diis
19. Unknown syndrome -Fever due to increased mosquito population	Qandah
20. Arthritis	Gendibur
21. Tick paralysis	Qalal
22. Helminthiasis	Gorian
23. Influenza	Hergeb
24. Sudden death	Fitiq/ Saboth
25. Ephemeral Fever	Tunya
26. Impact/bloat syndrome	Labalol/ Dibir
27. Lice infestation	Injir
28. Mange	Chito
29. Babesia (blood in urine)	Qadhedig / kadhedig

List of Cattle Diseases in Wajir County	
Disease name	Local name
Ephemeral fever	Tunya/Tunyo/ Butalah /butesa
FMD	Habeb
CBPP	Sombesa/Sambap
Anthrax	Kut
Plant poisoning	Gadala/buri/ciliya
LSD	Furuq
Mange	Caada
Gastro intestinal obstruction due to Foreign material (polythene)	Bac/ Ba'ah
Trypanosomiasis	Luta
Anthrax	Kut
Babesiosis Blood in urine(haematuria)	Qadhedig / kadhedig
Lice	Injir

Annex 2: OIE-Listed diseases: Infections and infestations to be enforced in 2018

Multiple species diseases, infections and infestations Anthrax Bluetongue Crimean Congo haemorrhagic fever Epizootic haemorrhagic disease Equine encephalomyelitis (Eastern) Heartwater Infection with Aujeszky's disease virus Infection with Brucella abortus, Brucella melitensis and Brucella suis Infection with Echinococcus granulosus	Cattle diseases and infections Bovine anaplasmosis › Bovine babesiosis › Bovine genital campylobacteriosis › Bovine spongiform encephalopathy › Bovine tuberculosis › Bovine viral diarrhoea › Enzootic bovine leukosis › Haemorrhagic septicaemia › Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis › Infection with Mycoplasma mycoides subsp. mycoides SC (contagious bovine pleuropneumonia) › Lumpy skin disease › Theileriosis › Trichomonosis › Trypanosomosis (tsetse-transmitted) Sheep and goat diseases and infections • Caprine arthritis/encephalitis

Infection with Echinococcus multilocularis Infection with foot and mouth disease virus Infection with rabies virus Infection with Rift Valley fever virus Infection with rinderpest virus Infection with Trichinella spp. Japanese encephalitis New world screwworm (Cochliomyia hominivorax) Old world screwworm (Chrysomya bezziana) Paratuberculosis Q fever Surra (Trypanosoma evansi) Tularemia West Nile fever	• Contagious agalactia • Contagious caprine pleuropneumonia • Infection with Chlamydophila abortus(Enzootic abortion of ewes, ovine chlamydiosis) • Infection with peste des petits ruminants virus • Maedi-visna • Nairobi sheep disease • Ovine epididymitis (Brucella ovis) • Salmonellosis (S. abortusovis) • Scrapie • Sheep pox and goat pox Camel diseases and infections Camelpox

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