OCTOBER TO DECEMBER 2022 SEASON SUMMARY REPORT – PHASE 2

DRIVE INDEX BASED LIVESTOCK INSURANCE (IBLI)

1. BACKGROUND

DRIVE is a Horn of Africa project, funded by the World Bank and implemented by governments with an aim of enhancing pastoralists' access to financial services for drought risk mitigation, include them in the value chains, and facilitate the livestock trade in the Horn of Africa. After the signing of the Project Financing Agreement in June 2022, DRIVE was declared effective in October 2022, and has two components:

- Component I: Package of financial services for climate resilience
- Component II: Livestock Value Chains and Trade Facilitation.

ZEP-RE (PTA Reinsurance Company) oversees Component I implementation in the four countries (Kenya, Somalia, Ethiopia, and Djibouti). This component has insurance, savings, digital accounts, and platform coordination. Component II is implemented by the Kenya Development Corporation (KDC) and the State Department of Livestock (SDL). In Kenya, the government is targeting implementation of the DRIVE Project in 21 arid and semi-arid lands (ASAL) with an aim of reaching pastoralists with resilience building tools against drought as well as develop capacity for the livestock value chain development. The IBLI product was developed to be used to back pastoralists' savings in the case of severe drought. It is designed to keep animals alive in an affordable way and to rapidly trigger and distribute payouts without the need for evidence of livestock dying. The IBLI product is designed based on a forage scarcity index developed using anomalies in Normalised Difference Vegetation Index (NDVI) based on eVIIRS data from 2002 to 2021. The table below summarises the product features that has been distributed in Kenya for the 2022 – 2023 season.

Table 1: Summary Product Description

Feature	Description
Index	The index is a Normalised Difference Vegetation Index – NDVI, using remote-sensed data (from satellites) on pasture levels.
Coverage period	The monitoring period for Kenya is based on the length of the vegetation growing season (rainy months) and the dry months as well. Short Rains, Short Dry Season: October – February Long Rains, Long Dry Season: March – September While the contracts are issued on an annual basis, covering all the seasons.
Unit Areas of Insurance (UAI)	Several UAIs per region determined based on the homogeneity of vegetation conditions and pastoral migration extents. Also, rangeland dominance, forage availability, seasonality and drought history are also considered.
Trigger & Exit	The trigger level has been set at the 25th percentile and the exit level at the 5th percentile. The selected trigger corresponds to a return period, which expresses the frequency with which the contract would

	have triggered based on the selected threshold and the underlying NDVI data. This model adopts 1 in 4 seasons return period for the trigger (25th percentile) and an Exit threshold at 1 in 20 seasons return period (5th percentile). This an improvement from KLIP 1 in 5 seasons return period for the trigger (20th percentile) and an exit threshold at 1 in 20 seasons.
NDVI Data	EVIIRs Satellite with 375m resolution.

This report covers the second payout of the Short Rains, Short Dry Season (SRSD) covering the months of January 2023 – February 2023. For this season only 4 counties were covered i.e., Garissa, Wajir, Tana River and Samburu.

2. UNDERWRITING DETAILS

Insured:	Pastoralists in Kenya against prolonged forage scarcity caused by drought ONLY
Product description:	The product's main aim is to provide cover against prolonged forage scarcity ONLY because of a drought. It triggers payment to pastoralists to help maintain their livestock in the face of severe forage scarcity. The payment amount depends on the value derived from the NDVI index.
Period of Insurance :	1st October 2022 to 30th September 2023
Calculation period:	1st January 2023 to 28th February 2023 (Short rains, Phase 2)
Type of Cover:	Index based livestock insurance based on Normalised Difference Vegetative Index, NDVI
Scope of Cover (Perils):	Forage scarcity because of drought.
Areas of Cover:	Kenya (Garissa, Wajir, Samburu and Tana River)
No. of insured farmers:	16,829
Total Sum Insured:	USD 10,956,918 (Ksh. 1,314,830,136)
Total Premium:	USD 2,087,298 (Ksh. 250,475,778)

3. DROUGHT SITUATION[1]

Cumulative rainfall was less than 55% of the 40-year average since October 1st, 2022, leading to severely diminished food and income from livestock production among pastoral households and crop production and agricultural labor among agropastoral and farming households. The October to December 2022 short rains had a late onset, with cumulative rainfall in October largely less than 85% of the 30-year average across most of Kenya.

Pasture conditions: Following four consecutive below-average rainy seasons and a poor start to a likely fifth below-average rainy season, reports indicate that browse and pasture conditions were largely poor in the northwestern, northern, and northeastern pastoral livelihood zones. Remote-sensing data, including the satellite-derived eVIIRS Normalised Difference Vegetation Index (NDVI), confirmed ground reports that vegetation greenness was less than 80%

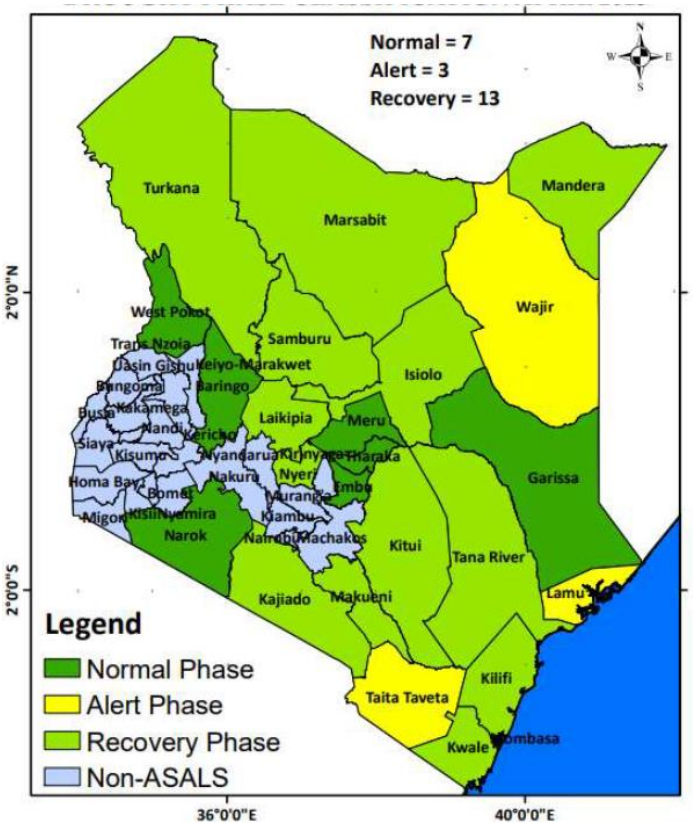
[1] Kenya - Food Security Outlook: Mon, 2022-10-31 to Wed, 2023-05-31 | Famine Early Warning Systems Network (fews.net)

of normal across most of Kenya. In particular, in the northwestern, northern, northeastern, and southeastern areas of Kenya, vegetation greenness is less than 60% of the 2012 to 2021 mean.

The drought situation over the period under review was critical in 22 of the 23 ASAL counties due to the late onset and poor performance of the much-anticipated October to December 2022 short rains, coupled with four previous consecutive failed rainfall seasons.

In April 2023, however, due to the start of the long rains, out of the 23 counties classified as arid and semi-arid lands, Three counties (3), Wajir, Taita Taveta and Lamu remain in **Alert** drought phase while Seven (7) counties namely Embu, Meru, Tharaka Nithi, West Pokot, Baringo, Garissa and Narok are in **Normal** drought phase. Thirteen (13) counties including Isiolo, Kajiado, Kilifi, Kitui, Kwale, Laikipia, Makueni, Mandera, Marsabit, Samburu, Tana River, Turkana and Nyeri are in the **Recovery** drought phase as shown in the figure below:

Figure 1: Drought Phase Classification, April 2023.



4. DATA AND MAPS

The table below shows a brief description of the data set used.

Table 2: Summary of the data characteristics

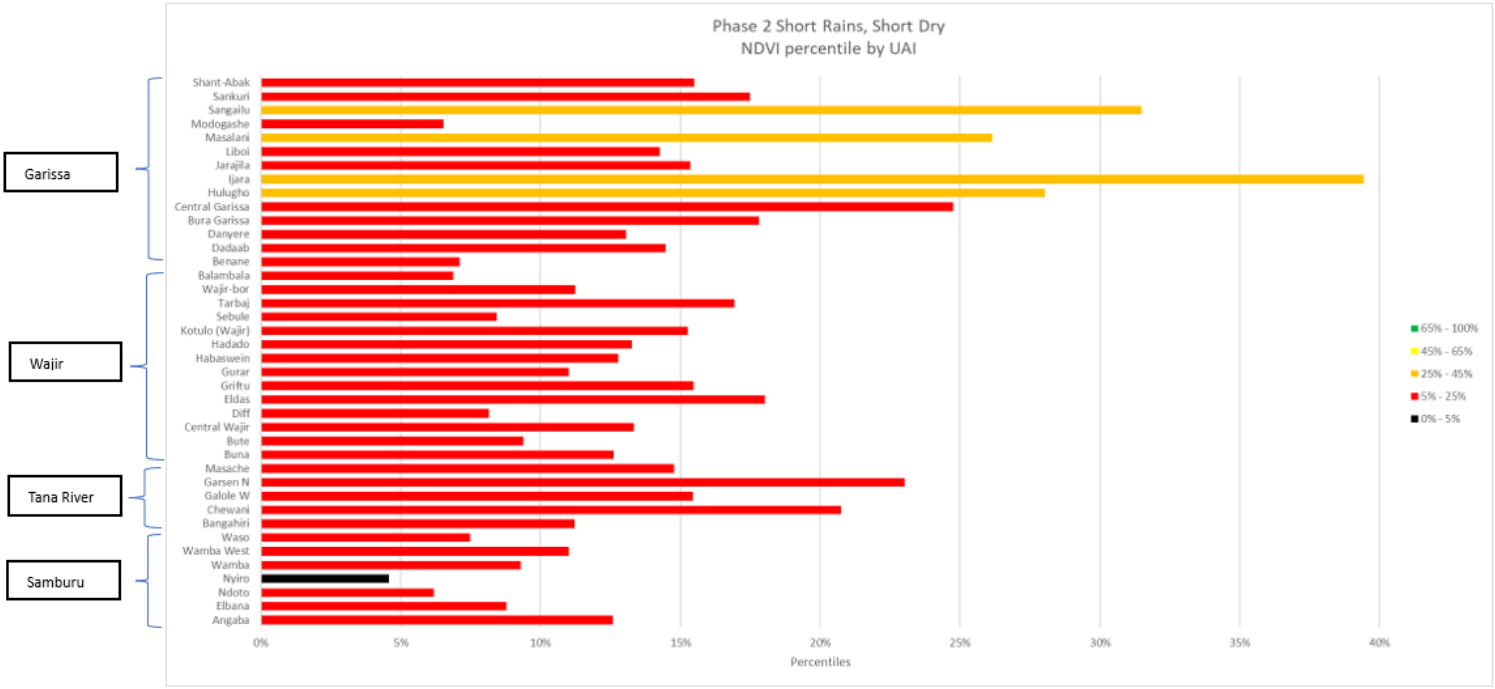
Data Source & Data Characteristic	
ITEM	**Description**
Data Source	eVIIRS
Characteristics	Visible and infrared imagery along with global observations of Earth's land, atmosphere, cryosphere, and ocean.
Historical time series length	10 years with 10 years backwards normalisation
Spatial Resolution	375 m X 375 m
Temporal Resolution	7- or 10-day data composited data sets updated every 5 days
Data Availability (free or premium)	Free
Instruments	Suomi National Polar-orbiting Partnership (Suomi NPP) and NOAA-20 satellites

The figure below shows the percentiles per UAI for historical data (2003 – 2022)[2] and for the period under review (January – February 2023). Key to note is that the percentiles are representative of the levels of the NDVI during the period under observation. This has been done cumulatively for January – February 2023 and compared with the long-term distribution. However, the percentiles cannot be directly used to convert to a payout amount for each UAI due to the technicalities of the z-score and payout calculation, which looks at the maximum possible payout percentage in a phase and also factors in a 5% deductible[3]. From Figure 2 below, 36 out of 40 UAIs covered in the 4 counties were expected to trigger a payout as they all show percentile figures below 25%.

[2] Used 2003 – 2022 as opposed to 2002 - 2021 as there was no data for the Short Rains, Short Dry period for 2002.

[3] 5% deductible is applied to the payout percentage whereby, if the payout percentage is greater than 5%, then the final payout percentage will be (x-5%), if it is less than 5%, then the final payout % will be 0%.

Figure 2: Graph showing the UAIs covered in Kenya and the cumulative NDVI percentiles.



The table below shows descriptions for each of the percentile ranges:

Key	Range	Description
	0% - 5%	Exit point - Point at which the maximum payout is made i.e., 20% in Phase 1 and 11.7% in Phase 2
	5% - 25%	Payout expected depending on the level of vegetation greenness
	25% - 45%	
	45% - 65%	
	65% - 100%	No payout expected

From the graph above, 36 UAIs have an NDVI percentile of less than 25% implying that the vegetation levels were below the 25% threshold and payout is due. However, in calculating the final payout percentage, only 31 were eligible for payout and this is because, the overall payout percentage was lower than the 5% deductible on the product leading to a 0% payout. The table below shows the NDVI percentiles against the expected payout percentages, without removing the deductible. In allowing for the deductible, all the 9 UAIs listed below are not eligible for payout.

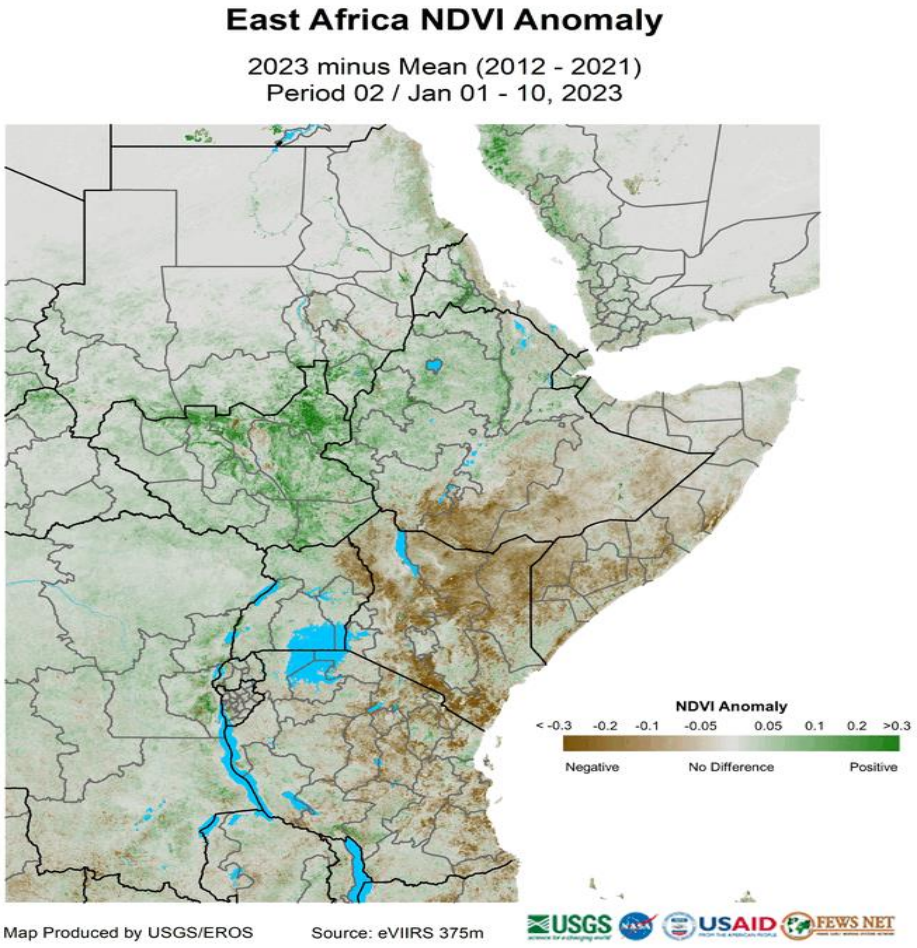
The deductible was included to reduce the cost of insurance and to also reduce the costs of paying out small claims.

Table 3 : Cumulative NDVI percentile figures vis à vis payout percentages

County	UAI	NDVI Percentile	Payout %_no deductible
Samburu	Angaba	12.58%	4.86%
Garissa	Central Garissa	24.77%	0.52%
Tana River	Chewani	20.75%	3.45%
Tana River	Garsen N	23.01%	2.26%
Garissa	Hulugho	28.04%	0.71%
Garissa	Ijara	39.43%	0.00%
Garissa	Liboi	14.26%	4.00%
Garissa	Masalani	26.16%	0.00%
Garissa	Sangailu	31.49%	0.00%

Further, figure 3 below, shows how the drought situation progressed in Kenya and East Africa over the period under review. The **brown** is the negative index reading (NDVI) showing a lack of vegetation, **grey** index is where there is no difference and **green** is the positive index. The images indicate that much of Kenya experienced poor vegetation health owing to the poor performance of the short rains season.

Figure 3: NDVI Anomaly Map as of 28 February 2023



5. CLAIM DETAILS

Period Of Loss: 1st January 2023 to 28th February 2023 (Short Rains, Phase 2)

Date Reported: May 2023

Calculated payout: **USD 684,250 (KSh 82,108,980)**

For phase 2, 31 out of 40 UAI have payouts triggered, with the highest having a payout of 11.7% and the lowest having 0.6%. The remaining 9 UAIs recorded no payout.

The table below shows the distribution of the payouts per county.

Table 4: Distribution of total payouts per County (Phase 1 & 2 combined)

County	UAIs	Pastoralists	Total Premium (KSh)	Phase 1 Average payout %	Payout Phase 1 (KSh)	Phase 2 Average payout %	Payout Phase 2 (KSh)	SRSD [4] Payout (KSh)
GARISSA	15	3,688	56,638,488	14.52%	34,028,954	4.20%	8,908,835	42,937,790
SAMBURU	7	3,117	39,027,778	17.74%	36,668,710	7.81%	14,258,529	50,927,239
TANA RIVER	5	6,834	104,135,948	9.00%	51,432,897	4.58%	29,114,739	80,547,637
WAJIR	13	3,032	48,810,239	19.84%	49,320,441	11.62%	29,109,756	78,430,197
UNKNOWN[5]		158	1,863,326	16.12%	1,588,188	7.29%	718,120	2,306,307
Total	**40**	**16,829**	**250,475,778**	**16.12%**	**173,039,189**	**7.29%**	**82,109,980**	**255,149,169**

As expected, the payout amounts for Phase 2 are lower than Phase 1, and this is because of improved vegetation conditions in this period compared to the October – December 2022 period that was characterized by delayed onset of rainfall.

[4] This is the total Short Rains payout

[5] Unknown – These are pastoralists who paid without registering their locations and are yet to be traced and the payout percentage is an average of all the UAIs payout percentages.

COUNTY LEVEL ANALYSIS

1. Garissa County

GARISSA	Pastoralists	Premium (KSh)	Phase 1 Average payout %	Phase 2 Payout (KSh)	Phase 2 Average payout %	Phase 2 Payout (KSh)	SRSD Payout (KSh)
Balambala	248	4,079,297	20.00%	4,067,476	11.20%	2,277,786	6,345,262
Benane	109	1,793,719	20.00%	1,816,560	11.70%	1,062,688	2,879,248
Bura	417	6,711,726	5.50%	1,927,721	5.90%	2,067,919	3,995,639
Central G	877	12,921,256	4.40%	3,134,876	0.00%	-	3,134,876
Dadaab	129	2,118,756	20.00%	2,153,051	6.40%	688,976	2,842,028
Danyere	1	13,785	17.00%	11,805	3.20%	2,222	14,027
Hulugho	126	1,943,006	14.80%	1,555,848	0.00%	-	1,555,848
Ijara	154	2,393,264	10.30%	1,326,503	0.00%	-	1,326,503
Jarajila	407	7,018,615	14.10%	4,819,576	0.60%	205,088	5,024,664
Liboi	18	229,470	19.80%	273,008	0.00%	-	273,008
Masalani	396	5,533,688	12.90%	4,297,103	0.00%	-	4,297,103
Modogashe	199	2,860,017	20.00%	3,296,871	11.70%	1,928,670	5,225,541
Sangailu	100	1,694,158	9.10%	765,310	0.00%	-	765,310
Sankuri	462	6,647,466	9.90%	3,824,821	0.60%	231,807	4,056,629
Shant-Abak	45	680,266	20.00%	758,425	11.70%	443,679	1,202,104
TOTAL	**3,688**	**56,638,488**	**14.52%**	**34,028,954**	**4.20%**	**8,908,835**	**42,937,790**

In Phase 1**, Central Garissa** had the lowest payout relative to premium paid because from the percentile graphs, it was less dry than the other regions. This carries on to Phase 2, where there was no payout for this UAI following improved vegetation conditions and the application of the deductible. 5 additional UAIs also did not trigger a payout.

2. Samburu County

SAMBURU	Pastoralists	Premium (KSh)	Phase 1 Average payout %	Phase 2 Payout (KSh)	Phase 2 Average payout %	Phase 2 Payout (KSh)	SRSD Payout (KSh)
Angaba	401	5,633,189	13.50%	4,472,525	0.00%	-	4,472,525
Elbana	454	4,528,880	10.70%	2,752,064	9.30%	2,388,855	5,137,322
Ndoto	115	1,102,746	20.00%	1,416,914	10.10%	706,745	2,106,241
Nyiro	347	5,116,577	20.00%	5,790,322	11.70%	3,387,338	9,177,661
Wamba	433	5,097,861	20.00%	4,904,952	6.20%	1,525,182	6,445,122
Wamba West	991	13,602,848	20.00%	12,934,455	5.70%	3,686,320	16,620,775
Waso	368	3,864,729	20.00%	4,320,779	11.70%	2,527,656	6,848,435
Unknown	8	99,868	17.74%	97,238	7.81%	36,434	119,158
TOTAL	**3,117**	**39,046,698**	**17.74%**	**36,689,249**	**7.81%**	**14,258,529**	**50,927,239**

Only one UAI, Angaba, did not trigger any Phase 2 payouts because of improved vegetation conditions and the application of the deductible.

3. Tana River

TANA RIVER	Pastoralists	Premium (KSh)	Phase 1 Average payout %	Phase 2 Payout (KSh)	Phase 2 Average payout %	Phase 2 Payout (KSh)	SRSD Payout (KSh)
Bangahiri	1,626	25,913,678	16.00%	20,970,590	10.60%	13,893,016	34,863,606
Chewani	251	3,565,268	12.00%	2,326,130	0.00%	-	2,326,130
Galole W	2,279	35,088,981	3.40%	6,018,208	7.00%	12,390,427	18,408,635
Garsen N	2,032	29,986,750	13.60%	22,045,435	0.00%	-	22,045,435
Masache	630	9,429,156	0.00%	-	5.30%	2,794,384	2,794,384
Unknown	16	152,115	9.00%	72,535	4.58%	36,912	109,447
Total	**6,834**	**104,135,948**	**9.00%**	**51,432,897**	**4.58%**	**29,114,739**	**80,547,637**

Chewani and Garsen North did not trigger any payouts due to improved vegetation conditions relative to the historical observations and the application of the deductible.

4. Wajir

Wajir	Pastoralists	Premium (KSh)	Phase 1 Average payout %	Phase 2 Payout (KSh)	Phase 2 Average payout %	Phase 2 Payout (KSh)	SRSD Payout (KSh)
Buna	232	3,883,814	20.00%	3,902,245	11.70%	2,282,814	6,185,059
Bute	268	3,817,965	20.00%	4,492,074	11.70%	2,627,863	7,119,937
Central	449	6,321,246	20.00%	7,625,106	11.70%	4,460,687	12,085,793
Diff	347	5,278,973	20.00%	5,603,252	11.70%	3,277,902	8,881,154
Eldas	112	1,769,357	20.00%	1,798,984	11.70%	1,052,405	2,851,389
Griftu	372	6,772,232	20.00%	6,233,225	11.70%	3,646,437	9,879,662
Gurar	229	4,146,928	20.00%	3,851,600	11.70%	2,253,186	6,104,787
Habaswein	159	2,606,309	20.00%	2,532,338	11.70%	1,481,418	4,013,756
Hadado	315	5,249,151	20.00%	5,102,099	11.70%	2,984,728	8,086,827
Kotulo	364	6,010,184	17.90%	5,196,779	11.70%	3,396,777	8,593,556
Sebule	46	787,052	20.00%	777,861	11.70%	455,049	1,232,909
Tarbaj	113	1,729,162	20.00%	1,806,757	10.60%	957,581	2,764,338
Wajir-Bor	25	421,003	20.00%	381,303	11.70%	223,062	604,365
Unknown	1	16,862	19.84%	16,818	11.62%	9,847	26,664
Total	**3,032**	**48,810,239**	**19.84%**	**49,320,441**	**11.62%**	**29,109,756**	**78,430,197**

All the UAIs in Wajir triggered a payout for the second phase of the Short Rains, Short Dry season. This region is expected to be the driest, noting that it also triggered that maximum payout for Phase 1.

5. Unknown

These are pastoralists who did not register through the system but paid directly to the account. Minimal details are available, but efforts are being made to locate them to ensure they will receive their payout.

Their details are as shown below:

Pastoralists	Premium (KSh)	Phase 1 Average payout %	Payout Phase 1 (KSh)	Phase 2 Average payout %	Phase 2 Payout (KSh)	SRSD Payout (KSh)
158	1,863,326	16.12%	1,588,188	7.29%	718,120	2,306,307
158	**1,863,326**	**16.12%**	**1,588,188**	**7.29%**	**718,120**	**2,306,307**

Due to the unavailability of location data, the payout has been estimated based on the average payout for all the regions. i.e., 16.12% for Phase 1 and 7.29% for Phase 2. The next steps are to work with the State Department of Livestock (SDL) and county government officials to enable us to locate them and place them in the correct UAIs.

ANNEX TO THIS REPORT

1. Term sheet with the index.
2. Z-Score verification report from independent calculation agent, Planet.
3. Graphic showing the progression of the drought from January 2023 – February 2023 in the Horn of Africa.
4. Premiums and Claims payable distribution.