



DECEMBER 2021

Cane Availability Survey Report

2021/2022 - 2022/2023

PRESENTED BY
TECHNICAL AND ADVISORY SERVICES DEPARTMENT

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ACRONYMS AND ABBREVIATIONS

CSC	Chemelil Sugar Company
CC	Crop Color
CD	Crop Density
CPD	Crop Pests and Diseases infestation
CW	Crop Weeds infestation
GIS	Geographic Information System
Ha	Hectare
Tc	Tonnes cane
KISCOL	Kwale International Sugar Company Ltd
MSC	Mumias Sugar Company
MUSCO	Muhoroni Sugar Company
AFA	Agriculture and Food Authority
NE	Nucleus Estate
NSC	Nzoia Sugar Company
OG	Out growers
PC	Plant Crop
R1	Ratoon One
R2	Ratoon Two
R3+	Ratoon Three & Above
RC	Ratoon Crop
SONYSUGAR	South Nyanza Sugar Company
SRI	Sugar Research Institute
SD	Sugar Directorate
Tc/Ha	Tonnes Cane Per Hectare
TCD	Tones Cane Crushed Per Day
WEKSCOL	West Kenya Sugar Company Limited
BSIL	Busia Sugar Industry Limited
TSCL	Transmara Sugar Company Limited

1.0. EXECUTIVE SUMMARY

1.1. Introduction

The 2021 Industry cane availability survey was carried out in all 15 factory zones with a broad objective of assessing the state of sugarcane in the industry, identify production constraints and project mill cane availability. The exercise is an important aspect in regulating developing and promoting the Sugar Industry as the results of the survey are used to project the industry cane availability for budget purposes and decision making.

The surface area under cane expanded by 8.65% from 202,616 Ha in December 2020 to 220,138 Ha in December 2021, according to data collected. This was largely because of the expansion of the cane area in West Kenya, the catchments of the Butali Sugar Mills, and the Sukari Industries. The nucleus estate accounts for only 6% of the total cane land area, whereas the Outgrowers occupy 94% of the total cane land area.

Similarly, the expected yields for the year 2021 have climbed to 68.85 (Tonnes/Ha) from the previous year's yields of 61.85 (Tonnes/Ha). The cane acreage totalled 220,138 hectares and was distributed over 14 counties. Sugar cane was planted on the most land in Kakamega, accounting for 19.85 percent of the total land area, followed by Bungoma, which had 17.68 percent.

In December 2021, the industry's PC: R1: R2: R3+ crop cycles ratio was 27:34:22:17, compared to the industry standard of 30:30:30:10 for consistent cane supply. The 3 dominant varieties were CO 421 (41%), CO 945 (27%) and CO 617 (16%).

Based on current projections, 6,197,977 tonnes of cane will be available for crushing between December 2021 and June 2022, compared to the industry's demand for mill cane of 5,963,800 tonnes. This represents a cane surplus of 152,411 tonnes by the end of June 2022, according to Cane Census estimates.

During the season 2022/23, there will be 10,715,867 tonnes of cane available, compared to the industry's need of 10,637,000 tonnes, resulting in a shortfall of 73,759 tonnes of cane.

Cane supply shortages would affect Kibos Sugar and Allied Industries, Busia Sugar, South Nyanza, Nzoia, and Kwale, among other companies. On the other hand, West Kenya, Butali Sugar Mills, Sukari Industries, Transmara Company, and Olepito industries will have significant cane supply surpluses.

1.2. Summary of census Exercise

1.2.1. Area under cane

Table 1a: Area under Cane and Yields

SUGAR ZONE	Area under cane (Ha)		% Variance	Yields (Tc/Ha)		
	21-Dec	20-Dec		2021*	2020	% Variance
CHEMELIL	18,057	17,511	3.12	62.61	46.65	34.22
MUHORONI	14,996	13,666	9.73	62.96	48.48	29.87
MUMIAS	274	198	38.33	22.06	N/A	N/A
NZOIA	18,820	18,684	0.73	63.84	60.74	5.11
SOUTH NYANZA	8,194	9,197	-10.90	72.01	77.24	-6.78
KIBOS	8,056	7,379	9.18	70.37	68.82	2.26
SOIN	2,790	1,921	45.22	62.35	N/A	N/A
BUTALI	23,707	19,959	18.78	74.70	67.49	10.69
WEST KENYA	58,926	48,969	20.33	68.74	66.97	2.64
MIWANI	1,615	1,910	-15.43	30.34	34.49	-12.03
SUKARI	21,251	17,732	19.85	70.11	50.6	38.56
TRANSMARA	15,401	15,791	-2.47	94.48	133.16	-29.05
KWALE	7,287	6,763	7.75	74.27	46.1	61.11
OLEPITO	9,703	9,186	5.62	60.17	46.62	29.07
BUSIA	11,061	13,751	-19.56	69.60	46.37	50.09
TOTAL	220,138	202,616	8.65	68.85	61.85	11.31

**projected*

The area under cane increased by 8.65 % from 202,616 Ha in December 2020 to 220,138 Ha reported in December 2021. This was majorly due to expansion of cane area in West Kenya, Butali Sugar Mills and Sukari Industries catchments.

Industry mean productivity was projected at 68.85 Tc/Ha in December 2021, an increase of 11.31 % compared to 61.85 Tc/Ha reported in the same period 2020. The improvement in productivity could be attributed to good rains received in 2021, as well as mature cane harvested in the regions.

Table 1b: Area under Cane (Ha) and growers by Counties

COUNTY	AREA UNDER CANE (HA)			% COVER AGE	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)
	OUTGROWERS	NUCLEUS ESTATE	TOTAL			
KAKAMEGA	43,427	274	43,700	19.85	74,422	0.58
BUNGOMA	36,523	2,401	38,924	17.68	73,731	0.50
KISUMU	24,026	4,279	28,305	12.86	20,412	1.18
NAROK	18,263	24	18,287	8.31	16,637	1.10
BUSIA	16,875	124	17,000	7.72	24,954	0.68
NANDI	16,955	0	16,955	7.70	12,696	1.34
HOMABAY	13,923	0	13,923	6.32	10,199	1.37
KERICHO	9,747	741	10,489	4.76	10,385	0.94
MIGORI	7,864	2,331	10,194	4.63	11,143	0.71
TRANS NZOIA	7,540	0	7,540	3.43	2,077	3.63
KWALE	3,434	3,853	7,287	3.31	245	14.01
UASIN GISHU	3,997	0	3,997	1.82	2,155	1.85
KISII	2,443	0	2,443	1.11	2,190	1.12
VIHIGA	562	0	562	0.26	1,051	0.53
SIAYA	532	0	532	0.24	370	1.44
TOTAL	206,111	14,027	220,138	100.00	262,667	0.78
% COVERAGE	94	6	100	-	-	-

The 220,138 Ha cane area was spread in 14 Counties in the following proportions – Kakamega 19.85%, Bungoma 17.68 %, Kisumu 12.86%, Narok 8.31 %, Busia 7.72%,

Nandi 7.7%, Homabay 6.32%, Kericho 4.76%, Migori 4.63%, Transzoia 3.43%, Kwale 3.31%, Uasin Gishu 1.82%, Kisii 1.11%, Vihiga 0.26%, Siaya 0.24%.

The 6% of the surface was in the factory Nucleus Estates and 94% in the Outgrower cultivated by 262,667 farmers.

Figure 1: Bar graph representation of area under Sugarcane (Ha) by Counties

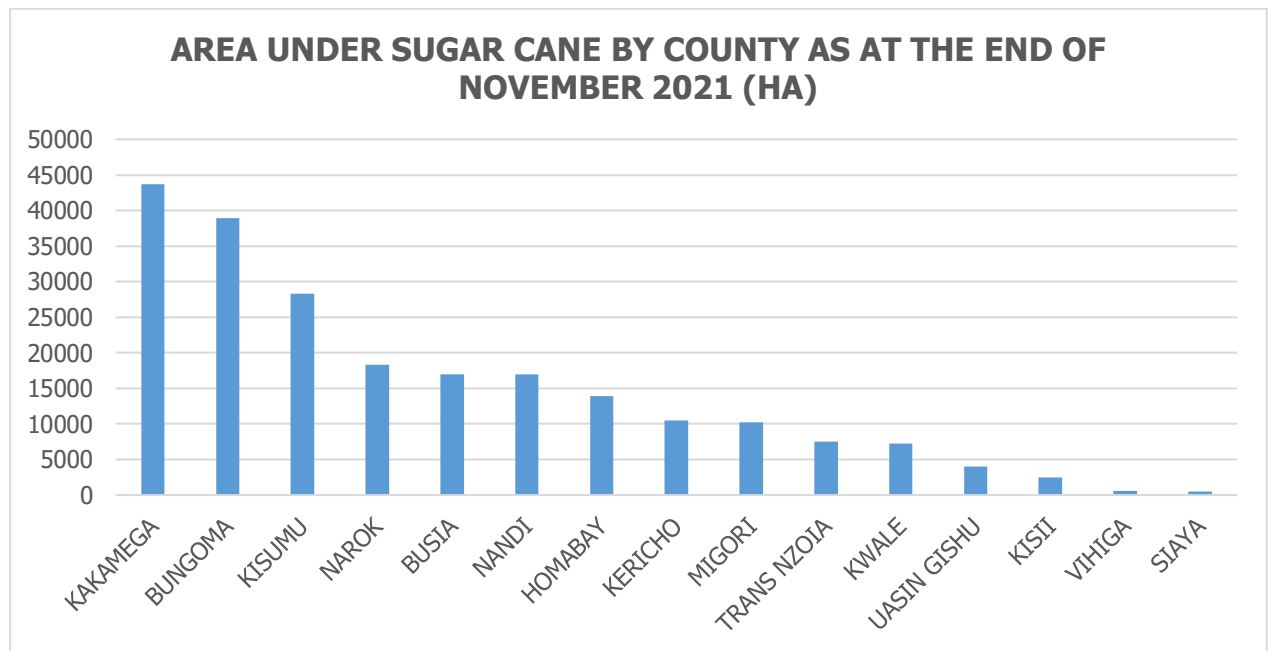
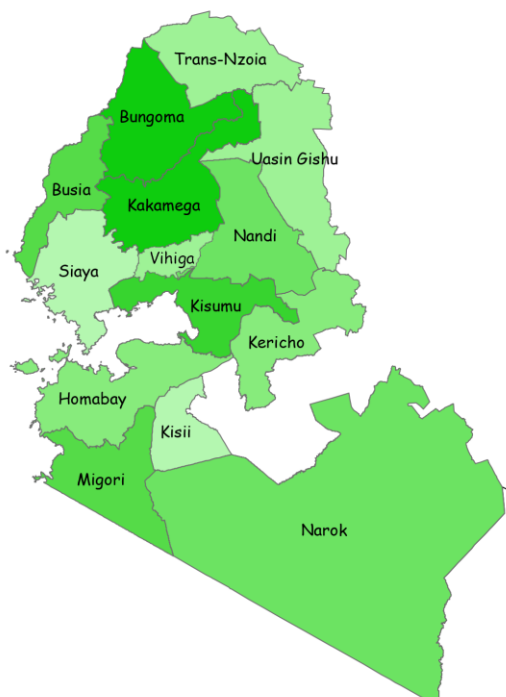


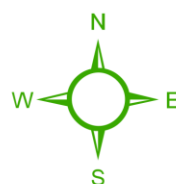
Figure 2: Sugarcane growing Counties, area under cane and number of growers

Area Under Cane as at November 2021



COUNTY	AREA UNDER CANE (Ha)		
	OUTGROWERS	NUCLEUS	TOTAL
KAKAMEGA	43,427	274	43,700
BUNGOMA	36,523	2,401	38,924
KISUMU	24,026	4,279	28,305
NAROK	18,263	23	18,287
BUSIA	16,875	124	17,000
NANDI	16,955	-	16,955
HOMABAY	13,923	-	13,923
KERICHO	9,747	741	10,489
MIGORI	7,864	2,331	10,194
TRANS NZOIA	7,540	-	7,540
KWALE	3,434	3,853	7,287
UASIN GISHU	3,997	-	3,997
KISII	2,443	-	2,443
VIHIGA	562	-	562
SIAYA	532	-	532
TOTAL	206,111	14,027	220,138
% COVERAGE	94	6	100

COUNTY	NO. OF FARMERS	AVERAGE CANE PLOT SIZE (Ha)
KAKAMEGA	74,422	0.58
BUNGOMA	73,731	0.50
BUSIA	24,954	0.68
KISUMU	20,412	1.18
NAROK	16,637	1.10
NANDI	12,686	1.34
MIGORI	11,143	0.71
KERICHO	10,365	0.94
HOMABAY	10,199	1.37
KISII	2,443	1.12
UASIN GISHU	2,155	1.85
TRANS NZOIA	2,077	3.63
VIHIGA	1,051	0.53
SIAYA	370	1.44
KWALE	245	14.01
TOTAL	262,667	0.78
% COVERAGE	-	-



1.2.2. Area under cane by crop classes

Table 2: Area under Cane by Crop Cycle (Ha)

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	56,804	3,456	60,260	27
R1	73,492	1,917	75,410	34
R2	45,607	2,220	47,827	22
R3+	30,208	6,434	36,641	17
TOTAL	206,111	14,027	220,138	100

The PC: R1:R2: R3+ crop cycles ratio in the industry was 27:34:22:17 in December 2021 against the industry standard of 30:30:30:10 for stable cane supply. The high plant to ratoon crop proportion was indicative of sustained cane planting activities mainly by private mills. Sustained cane planting by all players would stabilize required ratios for future sustainable cane supply.

1.2.3. Area under cane by varieties

Table 3: Area under Cane by Varieties

SN	VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
1	CO 421	87,827	2,167	89,995	41
2	CO 945	56,295	2,385	58,681	27
3	CO 617	32,482	2,266	34,748	16
4	CO 1148	247	29	276	0
5	D 84 84	4,655	509	5,164	2
6	CB 38/22	1,658	1,891	3,549	2
7	N 14	5,502	406	5,907	3
8	KEN 83-737	2,811	980	3,791	2
9	CO 331	294	-	294	0
10	EAK 70 76	58	51	109	0
11	EAK 90 97	7	356	363	0
12	EAK 73 335	82	142	224	0

13	KEN 82 808	643	1,240	1,883	1
14	KEN 82 062	-	3	3	0
15	KEN 82 216	5	3	8	0
16	KEN 82 472	1,082	21	1,103	1
17	KEN 82 601	-	30	30	0
18	KEN 82 493	14	-	14	0
19	KEN 98 533	4	3	7	0
20	FR 95 2345	1,285	72	1,356	1
21	MS 98 21	7	178	185	0
22	MS 2001 1100	-	7	7	0
23	Others	3,917	233	4,150	2
24	Mixed	7,237	1,054	8,291	4
	TOTAL	206,111	14,027	220,138	100

The 3 dominant varieties were CO 421 (41%), CO 945 (27%) and CO 617 (16%). The improved varieties still occupied an estimated 11% of the Industry cane area.

The varieties CO 421, CO 617 and CO 945 accounted for large surface areas in the following cane growing zones respectively; Western, Nyando and South Nyanza.

Mixed varieties were still a challenge to the Industry and occupied a total of 8,291 Ha during the survey. We recommend adoption of a comprehensive seed cane production and distribution programme to manage the problem.

1.2.4. Cane Availability Projection

Table 4: Cane availability

FACTORY	DEC 2021 - JUN 2022			JUL 2022 - JUN 2023		
	MILL REQUIREMENT (TONNES)	AVAILABLE CANE (Tc)	SURPLUS (Tc)	MILL REQUIREMENT (TONNES)	AVAILABLE CANE (Tc)	SURPLUS (Tc)
CHEMELIL	492,000	486,844.57	(5,155)	840,000	719,602.88	(120,397)
MUHORONI	360,800	352,817.99	(7,982)	616,000	637,241.55	21,242
MUMIAS	-	2,627.32	2,627	-	6,498.21	6,498
NZOAIA	492,000	242,923.38	(249,077)	840,000	733,536.15	(106,464)
SOUTH NYANZA	492,000	308,367.62	(183,632)	825,000	297,601.67	(527,398)
WEST KENYA	1,066,000	1,501,544.92	435,545	2,015,000	2,774,806.11	759,806
SOIN	-	63,487.06	-	-	118,333.34	-
KIBOS	492,000	262,761.99	(229,238)	840,000	187,319.82	(652,680)
BUTALI	410,000	463,274.17	53,274	850,000	1,217,247.32	367,247
SUKARI INDUSTRIES	574,000	721,721.56	147,722	980,000	1,168,101.92	188,102
TRANSMARA	656,000	915,033.70	259,034	1,120,000	1,375,381.82	255,382
MIWANI-NUCLEUS	-	18,012.21	-	-	34,293.01	-
KWALE	396,000	408,150.52	12,151	801,000	541,196.21	(259,804)
OLEPITO	123,000	246,700.58	123,701	210,000	536,824.35	326,824
BUSIA SUGAR INDUSTRY	410,000	203,709.59	(206,290)	700,000	367,882.51	(332,117)
TOTAL	5,963,800	6,197,977	152,678	10,637,000	10,715,867	(73,759)

It is projected, **6,197,977 tonnes** cane will be available for crushing between December 2021 and June 2022 against the Industry mill cane requirement of **5,963,800 tonnes**. This reflects a cane surplus of **152,678 tonnes** by end of June 2022.

During 2022/23 season, **10,715,867 tonnes** of cane will be available against the industry cane requirement of **10,637,000 tonnes** resulting to a deficit of **73,759 tonnes**. West Kenya, Butali Sugar Mills, Sukari Industries, Transmara Company and

Olepito factories will have substantial cane supply surpluses whereas Kibos Sugar and Allied Industries, Busia Sugar, South Nyanza, Nzoia and Kwale will experience cane supply deficits.

Generally, the industry will experience improved cane supplies if regional inter mill cane transfers will be adopted to crush the over mature cane noted in most of the zones.

1.3. Recommendations

1. Synchronize cane availability with factory cane requirement through Cane development, in the meantime adopt structured intermill cane transfers between neighbouring mills experiencing surplus and deficit cane supply;
2. Adopt and enhance propagation of local improved sugarcane varieties;
3. Implement seed cane development program in all factory zones to avail clean planting material to growers;
4. Work towards restoring and sustaining a PC: 1R:2R:3R+ ratio of 30:30:30:10 for a stable cane supply;
5. Adopt the best practices in yield enhancement in the industry;
6. Adopt prompt payment of farmers' proceeds for cane deliveries by all millers to facilitate early maintenance of subsequent ratoons.

2.0. CANE AVAILABILITY SURVEY, BACKGROUND AND APPROACH

2.1. Introduction

The survey was undertaken from 6th to 16th December 2021. This was done by six (6) field enumeration teams who carried out visual physical assessment of cane to estimate the expected yields. The training of enumerators was conducted by staff from Sugar Directorate, AFA- Research Planning and Management Department and Kenya Space Agency to enhance accuracy of data.

During the survey, cane inventory data was provided by millers while enumerators estimated productivity of the cane crop through physical observation in the fields for crop vigour, crop colour, crop density, effects of weeds to yield and impact of pests and diseases infestation

A productivity index ranging between 0 and 4 was applied to cane crop from the age of 3 months for crop vigour, crop colour, crop density, effects of weeds and impact of pests and diseases infestation to yield.

Summation of the scores was used to estimate zonal productivity using threshold yields of 100, 90, 80 and 70 tonnes per hectare for plant crop, ratoon 1, ratoon 2 and ratoon 3 respectively. Projected production was estimated by multiplying the available cane area by average productivity for the specific catchment.

Constraints to cane production such as inadequate availability of resources for cane development among others were identified and possible mitigation measures proposed.

Field data capture was done using a mobile aided application Survey123 for ArcGis that improved on speed data flow between enumerators and the office, error tracking, and actual location using GPS.

The six (6) enumeration teams constituted were assigned a cluster of factories as below:

TEAM	REGION	FACTORIES
1	Nyando 1	Chemelil, Kibos
2	Nyando 2	Muhoroni, Miwani, Soin
3	South Nyanza	Transmara, South Nyanza, Sukari
4	Western A	West Kenya, Butali Sugar Mills, Mumias
5	Western B	Nzoia, Busia Sugar Industry, Olepito
6	Coast	Kwale International

2.2. Terms of reference

- To establish the overall cane availability in the industry;
- To determine the crop distribution by crop cycle, age and variety in all sugar zones; and
- To identify the constraints to cane production and develop mitigating strategies.

2.3. Method

- Enumerators were proportionately allocated to factories based on area under cane in the catchments. Other considerations included average land holdings and expansiveness of the cane zone;
- Management of the respective mills were requested and recruited suitable personnel on behalf of AFA- Sugar Directorate;
- Enumerators were paired with mill staff to enhance plots identification and accuracy of data collected;
- Enumerators and mill staff were trained on yield estimation and data collection tool;
- Millers provided cane inventories to guide random sampling of cane plots and plots details, the target sample size was at 30%;
- Cane plots were randomly sampled based on characteristics such as site, varieties, age (m), crop cycle etc.;
- Factory mill coordinators assisted with logistical organization and preparation of summary factory reports;
- Visual assessment of the crop was carried out and scored on a scale of (0-4) based on five parameters: Crop Vigor (CV), Crop Colour (CC), Crop Density (CD), Weeds infestation (WD), Pests, and Disease infestation (PD); and
- Data collected was transmitted real time to the central server in readiness for data analysis and report writing;
- The duration of the survey was seven days, one day for training of enumerators and six days for field data collection.

2.4. Personnel

The cane survey activity was conceptualized and coordinated by Richard Magero, Team leaders – Fredrick Kebeney, Beatrice Odiwa, Stanley Babikha, Kennedy Nyongesa, Joseph Ochollah, Team members –Patricia Njeru, Agnes Wainaina, Daniel Onyango, Stanley Koech, Elisha Mtogo, Shadrack Kiprono, Paul Songa, Basir Musa, Nancy Atieno, Barbara Maende, John Kyule, Alvin Mwangi, Peter Okello, Stephen Wanjala, assisted by mill staff and enumerators.

3.0. SOIN SUGAR COMPANY LTD.

3.1. Area under Cane

3.1.1. Area under cane by counties

Table 5: Area under cane by counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL HECTARES	NO. OF OUTGROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% AREA COVERED
KERICHO	SOIN/SIGOWET	2,789.77	0	2,789.77	3000	0.93	100
	SUB-TOTAL	2,789.77	0	2,789.77	3,000	0.93	100

The cane supply catchment for Soin sugar Company was solely in Kericho County.

3.1.2. Area under cane by sector and yields

Table 6: Area under Cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUT GROWERS	2,789.77	1,921.00	62.35	N/A
NUCLEUS	0	0	0	0
TOTAL	2,789.77	1,921.00	62.35	N/A

The area under cane increased by 45% to 2,789.77 Ha from 1,921.00 Ha reported in December 2020. This could be due to cane planting by growers owing to the ready market for mill cane by neighbouring mills and the new trans loading sites in the zone. The projected zonal yield of 62.35 Tc/Ha was relatively close to the industry projected yield of 68.85 Tc/Ha.

3.2. Area under cane by Crop Classes

Table 7: Area under cane by Crop Classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS (HA)	TOTAL (HA)	% COVERAGE
PC	686.67	0	686.67	25
R1	934.92		934.92	34
R2	774.39		774.39	28
R3+	393.79		393.79	14
TOTAL	2,789.77	0	2,789.77	100

The crop cycles PC: R1:R2: R3+ ratio was 25:34:28:14 against the Industry standard of 30:30:30:10 for stable cane supply. The low ratio of plant to ratoon crops could be attributed to reduced cane planting due to farmers' apathy over prolonged closure of Soin Sugar Factory.

3.3. Area under cane by varieties

Table 8: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	593.45		593.45	21
CO 945	911.19		911.19	33
CO 617	576.63		576.63	21
D 84 84	55.59		55.59	2
CB 38/22	108.48		108.48	4
N 14	178.80		178.8	6
KEN 83-737	297.18		297.18	11
EAK 73 335	68.45		68.45	2
TOTAL	2,789.77	0	2,789.77	100

The most popular variety Co 945 occupied 33% followed by Co 421 (21%) and Co 617 (21%) and others 24%.

The sugarcane varieties mix in the zone was satisfactory.

3.4. Area under cane by crop ages

Table 9: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 – 6	901.42	0	901.42	29
7 -12	870.15	154.81	1024.96	33
13-18	873.20	27.301	900.501	29
19+	145	91.78	236.78	8
TOTAL	2,789.77	273.891	3,063.661	100

The bulk of the crop, 63% was 0 – 12 months and will be available during 2021/2022 season.

3.5. Cane availability projections

3.5.1. Cane projection for Dec 2021 to June 2022

Cane age available = 13 months and above
 Area under cane available = 1137.28 Ha
 Cane available = 1,137.28 Ha x 62.35 Tc/Ha = 70,909.40 tonnes.
 Mill cane requirement = 0 (Factory will be still under construction)

The projected available cane will therefore be milled by neighbouring mills majorly Kibos Sugar and Allied Industries.

3.5.2. Cane projection for 2021/2022

Cane age available = (0 -12) + (PC, R1 & R2)
 19+months
 Area under cane available = 2,162.38 Ha
 Cane available = 2,162.38 Ha x 62.35 Tc/Ha = 134,824.40 tonnes.
 Mill cane requirement = 0 (Factory will be still under construction)

The projected available cane will still be milled by neighbouring factories, majorly Kibos Sugar and Allied Industries.

3.6. Cane production constraints & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Poor road network	Engaging National and county government for funding	2021/22 Budget
Farmer apathy over closure of Soin Factory	Reopening of the factory	Major rehabilitation commences 2022 Q1
Farmer sensitization on future of the industry	Stakeholder engagements	County government Capacity building of Kericho County staff
Low uptake of new varieties	Availing the seed and addressing concerns (fear of poor ratooning)	KALRO support

4.0. BUTALI SUGAR MILLS LTD.

4.1. Area under cane

4.1.1. Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% AREA COVERAGE
KAKAMEGA	MALAVA	6,302	0	6302	14,415	0.44	26.58
	NAVAKHOLO	4,660	0	4660	4,082	1.14	19.66
	SHINYALU	857	0	857	1,011	0.85	3.61
	MUMIAS EAST	310	0	310	335	0.93	1.31
	LUGARI	3,465	0	3465	4162	0.83	14.62
	LIKUYANI	747	0	747	331	2.26	3.15
	SUB-TOTAL		16,341	0	16,341	24,336	1.07
BUNGOMA	TONGAREN	546	0	546	332	1.64	2.30
	SUB-TOTAL	546	0	546	332	1.64	2.30
NANDI	MOSOP	5002	0	5002	4112	1.22	21.10
	CHESUMEI	17	0	17	8	2.13	0.07
	SUB-TOTAL	5019	0	5019	4120	1.22	21.17
TRANS NZOIA	KIMININI	146	0	146	71	2.06	0.62
	SUB-TOTAL	146	0	146	71	2.06	0.62
UASIN GISHU	TURBO	1,655	0	1,655	1,232	1.34	6.98
	SUB-TOTAL	1,655	0	1,655	1,232	1.34	6.98
TOTAL		23,707	0	23,707	30,091	0.79	100

Table 10: Area under cane by Counties

The cane supply catchment was in the Counties of Kakamega (69%), Nandi (21%), Uasin Gishu (7%), Bungoma (2%) and Trans Nzoia (1%).

The proportion of cane in Nandi County increased by 3.04% from (18.13%) in 2020 to (21.17%) in 2021, this could be attributed to enhanced cane development in the area.

4.1.2. Area under cane by sector and yields

Table 11: Area under cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUT GROWERS	23,707	19,959	74.70	67.49
NUCLEUS	0	0	0	0
TOTAL	23,707	19,959	74.70	67.49

The area under cane increased by 19% to 23,707 Ha from 19,959 Ha reported in December 2020 majorly due to enhanced cane planting in Nandi County. Productivity was projected to improve by 11% to 74.70 Tc/Ha from 67.49 Tc/Ha realized in 2020. The envisaged yield improvement could be due to good rains received in 2021.

4.1.3. Area under cane by crop classes

Table 12: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	7,581	-	7,581	31.98
R1	8,779	-	8,779	37.03
R2	7,063	-	7,063	29.79
R3+	284	-	284	1.20
TOTAL	23,707	-	23,707	100

The crop cycles PC: R1:R2: R3+ ratios was 32:37:30:1 against the industry standard of 30:30:30:10 for stable cane supply. The high plant crop proportion could be attributed to enhanced cane planting initiatives in the zone.

4.2. Area under cane by varieties

Table 13: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	21,367	0	21,367	90.13
CO 945	827	0	827	3.49
D 84 84	714	0	714	3.01
N 14	408	0	408	1.72
KEN 83-737	74	0	74	0.31
Others	317	0	317	1.34
TOTAL	23,707	0	23,707	100

The popular variety CO421 occupied 90%, CO945 -3.49%, D 84 84 -3%, N 14 2%, KEN 83 737- 0.3% and others 1.3%. Adoption of new improved locally bred varieties was still low in the zone.

Dominance of variety CO421 at 90% is due to its adaptability in the catchment, however it's risky given its susceptibility to the smut disease.

It is recommended that Butali develops and adopts a variety diversification program.

4.3. Area under cane by crop ages

Table 14: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	7,713	-	7,713	32.53
7 -12	8,698	-	8,698	36.69
13-18	5,244	-	5,244	22.12
19+	2,052	-	2,052	8.66
TOTAL	23,707	-	23,707	100

A total of 2,052 hectares was aged 19 months and above and was mature due for harvesting during December 2021.

4.4. Cane availability Projections

4.4.1. Cane Projection - Dec 2021- June 2022

Cane age available = 13 months and above
 Area under cane available = 7,296 Ha
 Cane available = 7,296 Ha x 74.70 Tc/Ha x 0.85 = 463,260 tonnes
 (Correction factor of 0.15)
 Mill requirement at 2,500 TCD = 164 days' x 2500 TCD = 410,000 tonnes
 Cane available surplus = 463,260 Tc – 410,000 Tc = **53,260 tonnes**
 A cane supply surplus of 53,260 Tonnes was projected by the end of June 2022.

4.4.2. Cane projection - 2022/2023

Cane age available = (0 -12) months + (PC + 1R+ 2R)19+ months
 = 16,411 + 2,046
 Area under cane available = 18,457 Ha
 Cane available = (18,457 Ha x 74.70 Tc/Ha x 0.85) Tonnes
 + 53,260 Tonnes
 = 1,171,927 + (53,260) *0.85
 = 1,217,247.32
 Mill requirement at 2500 TCD = 330 days' x 2500 TCD = 825,000 tonnes
 Cane supply surplus = (1,217,247.32 – 825,000) tonnes
 = **367,247 tonnes**

A cane supply surplus of 367,247 tonnes is projected by the end of June 2023.
 We recommend regional inter mill cane transfer to deficit mills in order to avert the delayed harvesting associated with excess cane supply.
(NB: During the cane availability projection, a correction factor of 0.15 was used for the area under cane as an estimate for overlapping in area with West Kenya sugar).

4.5. Cane production constraints & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Poaching of cane	Zoning of cane areas	Poor return on investments on raw material and credit
Lack of subsidized credit to farmers	Accessibility to affordable credit	Financial Institutions to create a special purpose vehicle
Poor feeder roads	Cess fund to be utilized properly to maintain roads	

Fire during dry season	Insurance to be made available for fire accident	
Unavailability of commodity fund	Approach of commercial banks	Higher rate of interest

5.0. NZOIA SUGAR COMPANY LTD.

5.1. Area under cane

5.1.1. Area under cane by Counties

Table 15: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% COVERAGE
BUNGOMA	WEBUYE WEST	6,201.45	1,018.32	7,219.77	16,656	0.43	38.36
	WEBUYE EAST	1,376.58	0	1,376.58	2,835	0.49	7.31
	KIMILILI	618.69	-	618.69	1,184	0.52	3.29
	TONGARENI	74.97	-	74.97	129	0.58	0.40
	BUMULA	690.91		690.91	854	0.81	3.67
	BUNGOMA CENTRAL	2,044.23	-	2,044.23	6,414	0.32	10.86
	BUNGOMA SOUTH	5084.92	1382.32	6467.24	13623	0.47	34.36
	BUNGOMA WEST	2.11	-	2.11	3	0.70	0.01
	SUB-TOTAL	16,094	2,401	18,495	41,698	0.44	98.27
KAKAMEGA	MALAVA	7.19	0	7.19	8	0.90	0.04
	NAVAKHOLO	318.48	0	318.48	681	0.47	1.69
	SUB-TOTAL	325.67	0	325.67	689.00	0.47	1.73
TOTAL		16,419.53	2,400.64	18,820.17	42,387	0.44	100

The cane supply catchment for Nzoia sugar is in the Counties of Bungoma (98.27%) and Kakamega (1.73%).

5.1.2. Area under cane by sector and yields

Table 16: Area under cane by sector and yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUT GROWERS	16,419.53	15,918.81	64.55	62.53
NUCLEUS	2,400.64	2,764.74	61.10	52.95
TOTAL	18,820.17	18,683.55	63.84	60.74

The area under cane increased by 0.7% to 18,820.17 Ha from 18,683.55 Ha registered in December 2020. The increase in cane area could be attributed to cane development activities in the Outgrower sector.

The average cane yield was projected to improve by 5.10 % from 60.74 Tc/Ha realized in 2020 to 63.84 Tc/Ha in 2021. Improvement in yields is majorly attributable to the conducive climatic conditions experienced in 2021.

5.2. Area under cane by crop classes

Table 17: Area under cane and by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	773.61	620.31	1,393.92	7
R1	4,782.85	395.13	5,177.98	28
R2	4,184.45	382.44	4,566.89	24
R3+	6,678.62	1,002.76	7,681.38	41
TOTAL	16,419.53	2,400.64	18,820.17	100

The crop cycles PC: R1:R2: R3+ ratio was 7:28:24:41 in December 2021 against industry recommended ratios of 30:30:30:10 for stable cane supply. The low proportion of plant crops reflected low cane development activities in the zone due to cash flow challenges. The privatization of the firm should be fast tracked to overcome the financial challenges and enhance cane development activities.

5.3. Area under cane by varieties

Table 18: Area under cane by Variety

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	8,517.37	1.38	8,518.75	45
CO 945	3,913.82	716.48	4,630.30	25
D 84 84	259.03	483.48	742.51	4
N 14	3,231.36	246.27	3,477.63	18
KEN 83-737	463.95	447.63	911.58	5
EAK 90 97	5.00	-	5.00	0
KEN 82 472	1.20	11.05	12.25	0
MS 98 21	6.67	178.15	184.82	1
MS 2001 1100	-	7.38	7.38	0
Others	-	161.98	161.98	1
Mixed	21.13	140.54	161.67	1
TOTAL	16,419.53	2,394.34	18,813.87	100

The dominant variety in Nzoia cane catchment is CO 421 that occupies 45%, CO 945 -25%, N 14 -18%, KEN 83 737 -5%, D 84 84- 4% and others 3%. Adoption of the locally improved varieties was still low at 8%.

Concerted effort should be made to promote the locally bred varieties among farmers as the industry prepares to shift to a quality-based cane payment system.

5.4. Area under cane by crop ages

Table 19: Area under cane by ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	6,949.00	629.15	7,578.15	6,949.00
7 -12	6,652.75	784.32	7,437.07	6,652.75
13-18	2,615.98	707.21	3,323.19	2,615.98
19+	201.80	279.96	481.76	201.80
TOTAL	16,419.53	2,400.64	18,820.17	16,419.53

The over mature cane (19+) in the zone at the time of survey accounted for 3%.

5.5. Cane availability Projections

5.5.1. Cane Projection - Dec 2020 - June 2021

Cane age available	= 13 months and above
Area under cane available	= 106+376+3323 = 3,805 Ha
Cane available	= 3,805 Ha x 63.84Tc/Ha = 242,923.38 tonnes.
Mill requirement at 3,000 TCD	= 164 days' x 3,000 TCD = 492,000 tonnes
Cane supply deficit	= 242,923.38 - 492,000 = (249,077) tonnes

We projected a cane supply deficit of 249,077 tonnes by June 2022.

5.5.2. Cane Projection - July 2022– June 2023

Cane age available	= (0 -12) + (PC + R1+R2) 19+ months
Area under cane available	= 7,437+7,578+376 = 15,391 Ha
Cane available	= 15,391 Ha x 63.84 Tc/Ha - 249,077 Tonnes = 733,536.15Tonnes
Mill requirement at 3,000 TCD	= 280 days' x 3000 TCD = 840,000 tonnes
Cane supply deficit	= (733,536.15 - 840,000) = (106,464) tonnes

We project a Cane supply deficit of 106,464 tonnes by June 2023.

We recommend -:

- Plough out and replant advanced ratoon cane to normalize the crop cycles PC: R1:R2: R3+ratios to the industry standard 30:30:30:10 for sustainable cane supply;
- Factory operations be adjusted not to mill early the subsequent season's projected available cane; and
- Sustained yield enhancement initiatives to enhance mill cane availability.

5.6. Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Lack of fertilizer	Company to procure fertilizer	Inadequate funds
Inadequate cane development activities	Management to prioritize cane development activities	Inadequate funds
Land fragmentation	The National and County Government to develop a policy on land use.	Inadequate funds
Competition from other enterprises	To enhance cane productivity through	Inadequate funds

	effective extension services.	
Competition from other millers	To enhance service delivery to farmers to become more competitive	Inadequate funds

6.0. SOUTH NYANZA SUGAR COMPANY LTD.

6.1. Area under Cane

6.1.1. Area under cane by Counties

Table 20: Area under cane by counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% COVERAG E
MIGORI	URIRI	1,121.12		1,121.12	1929	0.58	13.68
	AWENDO	1,981.85	2,330.53	4,312.38	3703	1.16	52.63
	RONGO	587.61		587.61	869	0.68	7.17
	SUNA EAST	330.60		330.60	482	0.69	4.03
	SUNA WEST	11.79		11.79	6	1.97	0.14
	KURIA EAST	51.03		51.03	37	1.38	0.62
	SUB TOTAL	4,084.01	2,330.53	6,414.54	7,026	0.91	78.28
HOMABAY	RANGWE	150.03		150.03	222	0.68	1.83
	NDHIWA	38.42		38.42	83	0.46	0.47
	SUBTOTAL	188.45	-	188.45	305	0.62	2.30
NAROK	TRANSMARA WEST	1,450.63		1,450.63	844	1.72	17.70
	SUB TOTAL	1,450.63		1,450.63	844	1.72	17.70
KISII	GUCHA	140.48		140.48	305	0.46	1.71
	SUB-TOTAL	140.48		140.48	305	0.46	1.71
TOTAL		5,863.57	2,330.53	8,194.10	8,480	0.97	100

The raw material catchment for South Nyanza Sugar Company was in the Counties of Migori (78%), Narok (17%), Homabay (2%) and Kisii (1%).

6.1.2. Area under cane by sector and yields

Table 21: Area under Cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUT GROWERS	5,863.67	6,906.41	73.59	88.43
NUCLEUS	2,330.53	2,290.2	67.65	64.79
TOTAL	8,194.20	9,196.61	72.01	77.24

The area under cane reduced by 11% from 9,196.61 Ha to 8,194.20 Ha reported in December 2021. There is a general reduction in cane development in the Outgrower sector.

The yield decreased from 77.24 Tc/Ha realized in December 2020 to 72.01 Tc/Ha realized in December 2021. This may be attributed to inadequate supply of fertilizer to the Outgrower farms.

6.2. Area under cane by crop classes

Table 22: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	959.14	523.01	1,482.15	18.09
R1	2,316.50	338.53	2,655.03	32.40
R2	2,268.28	355.42	2,623.70	32.02
R3+	319.75	1,113.57	1,433.32	17.49
TOTAL	5,863.67	2,330.53	8,194.20	100

The crop cycles PC: R1:R2: R3+ ratio was 18:32:32:17 against the industry standard of 30:30:30:10 for sustainable cane supply. The low plant crop ratio in the zone could be attributed to low cane planting activities in the zone.

We **recommend** enhanced cane development activities to normalize the crop cycles ratios to the industry standard of 30:30:30:10 for PC, R1, R2 and R3+ respectively. This will as well increase cane area as appropriate for a 3,000 TCD factory.

6.3. Area under cane by varieties

Table 23: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	222.67	34.44	257.11	3.14
CO 945	5,408.11	1,388.79	6,796.90	82.95
CO 617	5.69	83.59	89.28	1.09
CO 1148		14.40	14.40	0.18
D 84 84	2.53	4.10	6.63	0.08
CB 38/22	1.49	94.73	96.22	1.17
N 14	53.17	24.94	78.11	0.95
KEN 83-737		150.84	150.84	1.84
EAK 70 76	25.29	50.99	76.28	0.93
KEN 82 247	48.53		48.53	0.59
KEN 82 062		2.61	2.61	0.03
KEN 82 472		4.28	4.28	0.05
KEN 82 601		7.29	7.29	0.09
Others	96.19		96.19	1.17
Mixed		469.53	469.53	5.73
TOTAL	5,863.67	2,330.53	8,194.20	100.00

The zonal popular variety CO 945 occupied (83%), Mixed (6%), CO 421 (4%), CB 38/22 (1%), KEN 83 737 (2%) and N14(1%).It is recommended that the proportion of CO 945 be scaled down while improved local varieties area be enhanced.

6.4. Area under cane by crop ages

Table 24: Area under cane by ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	1,410.52	912.54	2,323.06	28.35
7 -12	1,004.81	583.80	1,588.61	19.39
13-18	887.64	222.10	1,109.74	13.54
19+	2,560.70	612.09	3,172.79	38.72
TOTAL	5,863.67	2,330.53	8,194.20	100

The proportion of sugarcane at 19+ months was 39% signifying over mature cane in the zone.

6.5. Cane availability Projections

6.5.1. Cane projection - December, 2021 to June 2022

Cane age available	= 13 months and above	
Area under cane available	= 4,283 Ha	
Cane available tonnes.	= 4,283 Ha x 72.01 TCH	=308,367.62
Mill requirement at 3,000 TCD	= 164 days' x 3,000 TCD	=492,000 tonnes
Cane supply deficit tonnes	= 308,367.62 – 492,000	= (183,632)

We projected a cane supply deficit of 183,632 tonnes by June 2022.

6.5.2. Cane projection - 2022/2023

Cane age available	= (0 -12) + (PC +R1+R2)19+ months
Area under cane available	= 7,085 Ha
Cane available	= 7,085 Ha x 72.01 Tc/Ha -183,632 tonnes = 297,601.67 Tonnes.
Mill requirement at 3,000 TCD	= 275 days' x 3,000 TCD = 825,000 tonnes
Cane supply deficit	= (297,601.67 – 825,000) tonnes = (527,398.33) tonnes

We projected a cane supply deficit of 542,398 tonnes by June 2023.

The cane deficit will **be acute**; we therefore recommend rigorous cane planting coupled with yield enhancement initiatives for improved raw material supply to the factory.

Cane production constraints & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Lack of quality and improved seed cane material	Collaborate with KALRO-SRI for provision of certified seed material	AFA- Sugar Directorate established Nursery A plots at the Nucleus Estate to enhance seed cane supply
Over mature cane	Synchronize the cane harvesting supply and mill demand	

7.0. TRANSMARA SUGAR COMPANY LTD.

7.1. Area under Cane

7.1.1. Area under cane by Counties

Table 25: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% COVERAG E
MIGORI	Urii	789.08		789.08	1,606.81	0.49	5.12
	Rongo	384.20		384.20	797.00	0.48	2.49
	SUB-TOTAL	1,173.28	0.00	1,173.28	2,403.81	0.49	8
NAROK	TRANSMARA WEST	13,857	23.65	13880.58	14698	0.94	90
	SUB-TOTAL	13,857	24	13,881	14,698	0.94	90
KISII	SOUTH MUGIRANGO	347		347.3	924	0.38	2.26
	SUB-TOTAL	347	0	347	924	0.38	2
TOTAL		15,378	24	15,401	18,026	0.85	100

The raw material catchment for Transmara Sugar Company traversed the Counties of Narok (90%), Migori (8%) and Kisii (2%).

7.1.2. Area under cane by sector and yields

Table 26: Area under cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUT GROWERS	15,377.43	15,753	94.49	133.16
NUCLEUS	23.65	39	79.70	132.27
TOTAL	15,401.08	15,792	94.48	133.16

The area under cane reduced by 2% from 15,792 Ha in December 2020 to 15,401.08 Ha reported in December 2021.

The yield decreased from 133.16 Tc/Ha in 2020 to 94.48 Tc/Ha in 2021. This may be attributed to harvesting of over mature cane in the zone, however this is above the industry yield of 68.85 Tc/Ha.

7.2. Area under Cane by crop classes

Table 27: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS (HA)	TOTAL (HA)	% COVERAGE
PC	4,331.00	8.65	4,339.65	28
R1	6,922.90	7.10	6,930.00	45
R2	3,372.54	7.90	3,380.44	22
R3+	750.99	-	750.99	5
TOTAL	15,377.43	23.65	15,401.08	100

The crop cycles PC: R1:R2: R3+ ratio was 28:45:22:5 compared with the industry standard of 30:30:30:10 for stable cane supply. We therefore recommend review of harvesting system in view of over mature cane.

7.3. Area under cane by varieties

Table 28: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	6188.25	8.05	6196.3	40.23
CO 945	4163.06	0.24	4163.3	27.03
CO 617	1.54	0	1.54	0.01
D 84 84	3446.54	3.02	3449.56	22.40
CB 38/22		2.07	2.07	0.01
N 14	863.01		863.01	5.60
KEN 83-737	15.47	0.13	15.6	0.10
EAK 70 76	22.32		22.32	0.14
EAK 73 335	0.00	0	0	0.00
KEN 82 472	625.91	0	625.91	4.06
KEN 82 493	14.31		14.31	0.09
KEN 98 533	4.16	0.53	4.69	0.03
Mixed	32.86	9.61	42.47	0.28
TOTAL	15377.43	23.65	15401.08	100

The zonal popular varieties CO 421 occupied (40%), CO 945 (29%), D 84 84 (23%), N 14 (6%) KEN 82 472 (4%) among others.

The varieties diversification status in Transmara zone is satisfactory.

7.4. Area under cane by crop ages

Table 29: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	3,162.00	1.47	3,163.47	20
7 -12	2,545.65	6.57	2,552.22	17
13-18	3,229.77	10.37	3,240.14	21
19+	6,440.01	5.24	6,445.25	42
TOTAL	15,377.43	23.65	15,401.08	100

The proportion of cane 19+ months was 42% indicating mature cane that require harvesting.

7.5. Cane availability Projections

7.5.1. Cane projection - December, 2021 to June 2022

Cane age available	= 13 months and above		
Area under cane available	= 9,686 Ha		
Cane available tonnes.	= 9,686 Ha x 94.48 Tc/Ha	=	915,033.70
Mill requirement at 4,000TCD tonnes	= 164 days x 4,000 TCD	=	656,000
Cane supply surplus tonnes	= (915,033.70 - 656,000) Tc	=	259,034

We projected a cane supply surplus of 259,034 tonnes by the end of June 2022.

7.5.2. Cane projection - 2022/2023

Cane age available	= (0 -12) + (PC +1R +2R) 19+ months		
Area under cane available	= 12,161 Ha		
Cane available	= 12,161 Ha x 94.48 Tc/Ha + 259,034 Tc		
	= 1,375,381.82 tonnes.		
Mill requirement at 4,000 TCD tonnes	= 280 days' x 4,000 TCD	=	1,120,000
Cane supply surplus tonnes	= (1,375,381.82 – 1,120,000)	=	255,382

We project a cane supply surplus of 255,382 tonnes by June 2023. In general, the cane supply will be adequate for the TSCL factory.

7.6. Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Poor road network affecting cane transport	Collaborate with the relevant stakeholders to identify the roads that need maintenance.	
Undulating topography affecting access	Create farmer awareness on suitable land selection before cane growing	Capacity building of the farmers scheduled on quarterly basis by Transmara Sugar
Double contracting of farmers from neighbouring farms – especially Oloontare	Create farmer awareness on adherence to farmer/miller contracts	AFA-Sugar Directorate sensitizing farmers on contract farming through the media outlets
Rampant cane fires due to over mature cane	Synchronize cane supply and mill demand	

8.0. SUKARI INDUSTRIES LTD.

8.1. Area under Cane

8.1.1. Area under cane by Counties

Table 22: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% COVERAGE
HOMABAY	NDHIWA	13,106.1	0	13106.1	9,436	0.35	61.7
	HOMABAY TOWN	187.1	0	187.1	143	0.33	0.9
	RANGWE	272.9	0	272.9	182	0.38	1.3
	KARACHUONYO	168.0	0	168.0	133	0.32	0.8
	SUB-TOTAL	13,734.16	0.00	13,734.16	9,894.00	1.39	64.6
MIGORI	RONGO	475.0	0	475.01	309	0.17	2.2
	AWENDO	1,007.6	0	1,007.65	775	0.15	4.7
	URIRI	834.5	0	834.49	497	0.19	3.9
	SUNA EAST	37.1	0	37.11	17	0.25	0.2
	SUNA WEST	52.5	0	52.49	22	0.27	0.2
	KURIA WEST	136.7	0	136.70	51	0.31	0.6
	NYATIKE	62.9	0	62.91	42	0.17	0.3
	SUB-TOTAL	2,606.36	0	2,606.36	1,713	1.52	12.3
KISII	GUCHA	1955.6	0	1955.6	961	2.03	9.2
	SUB-TOTAL	1955.6	0.0	1955.6	961.0	2.0	9.2
NAROK	TRANSMARA WEST	2,955.4	0	2,955.35	1,095	2.7	13.9
	SUB-TOTAL	2,955.35	0.00	2,955.35	1,095.00	2.70	13.9
TOTAL		21,251.45	0.00	21,251.45	13,663.00	7.64	100.0

The raw material catchment for Sukari Industries Ltd was in the Counties of Homabay (65%), Migori (12%), Narok (14%) and Kisii (9%).

8.1.2. Area under cane by sector and yields

Table 31: Area under Cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	21,251.45	17,732.45	70.11	50.60
NUCLEUS	-	0	-	-
TOTAL	21,251.45	17,732.45	70.11	50.60

The area under cane increased by 20% from 17,732.45 Ha in December 2020 to 21,251.45 Ha in December 2022. This was indicative of rigorous cane development activities in the zones of Wath Buru, Lambwe Valley, Oluoth Kimira, Got Adundo, Jangoe.

The projected cane yield increased from 50.60 Tc/Ha in December 2020 to 70.11 Tc/Ha realized in December 2021. This enhanced yields could be attributed to good rains received in 2021 as well as irrigation in Wath Buru.

8.2. Area under cane by Crop classes

Table 32: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	5,788.86	-	5,788.86	27.24
R1	9,815.97	-	9,815.97	46.19
R2	4,324.85	-	4,324.85	20.35
R3+	1,321.78	-	1,321.78	6.22
TOTAL	21,251.46	-	21,251.46	100

The crop cycles PC: R1:R2: R3+ ratio was 27:46:20:6 compared with the industry standard of 30:30:30:10 for stable cane supply. The higher plant crop proportion was indicative of increased cane planting in the zone.

8.3. Area under cane by varieties

Table 33: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	8,419.94	0	8,419.94	47.48
CO 617	102.69	0	102.69	0.58
CO 945	7,398.14	0	7,398.14	41.72
D 84 84	39.26	0	39.26	0.22
N 14	571.52	0	571.52	3.22
OTHERS	1,200.9	0	1,200.90	6.78
TOTAL	17,732.45	0	17,732.45	100

Variety CO 421 was most popular and occupied 47%, CO 945 (42%), Others (7%), N 14 (3%) and CO 617(1%). There is a need to introduce improved varieties to the zone.

8.4. Area under cane by crop ages

Table 34: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	1,154.09		1,154.09	5.43
7 -12	9,803.07		9,803.07	46.13
13-18	6,237.93		6,237.93	29.35
19+	4,056.37		4,056.37	19.09
TOTAL	21,251.46	-	21,251.46	100

The proportion of cane that was 19+ months old was 19% indicative of over mature cane in the zone at the time of the survey.

8.5. Cane availability projections

8.5.1. Cane projection – December 2021 to June 2022

Cane age available = 13 months and above
 Area under cane available = 10,294 Ha
 Cane available = 10,294 Ha 70.11 TCH 721,721.56 tonnes.
 Mill requirement at 3,500 TCD = 164 days' x 3,500 TCD = 574,000 tonnes
Cane supply surplus = 721,721.56 - 574,000 = 147,722

We project cane supply surplus of 147,722 tonnes by June 2022.

8.5.2. Cane projection - 2022/2023

Cane age available = (0 -12) + (PC +1R +2R) 19+ months
Cane available = 15,013 Ha x 70.11 Tc/Ha + 147,722 tonnes
= 1,168.101.92 tonnes.
Mill requirement at 3,500 TCD = 280 days' x 3,500 TCD = 980,000 tonnes
Cane supply surplus = 1,168,101.92 – 980,000 = 188,102 tonnes

We project a cane supply surplus of 188,102 tonnes by June 2023.

We recommend cane sharing agreements with neighboring mills.

8.6. Cane production constraints & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Cane poaching	Avail more cane transport units and increase harvesting rate	
Transportation (Collapsed Bridge at Riat)	Bridge repair ongoing	

9.0. KWALE INTERNATIONAL SUGAR COMPANY

9.1. Area under Cane

9.1.1. Area under cane by Counties

Table 35: Area under cane by counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	AREA UNDER CANE(HECTARES)			NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% AREA COVERAGE
		OUTGROWERS	NUCLEUS ESTATE	TOTAL			
KWALE	MSAMBWENI	151.90	3,102.89	3,254.79	31	4.9	44.67
	LUNGALUNGA	3,276.15	750.46	4,026.61	213	15.38	55.26
	MATUGA	5.45	-	5.45	1	5.45	0.07
TOTAL		3,433.50	3,853.35	7,286.85	245.00	14.01	100.00

The raw material catchment for Kwale International Sugar Company Ltd. (KISCOL) was Kwale County in the Sub Counties of Lungalunga (55.26%), Msambweni (44.67%) and Matuga (0.07%).

9.1.2. Area under cane by sector and yields

Table 36: Area under Cane by sector and Yield

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	3,433.50	3,262.5	70.64	34.45
NUCLEUS	3,853.35	3,500.72	77.52	53.17
TOTAL	7,286.85	6,763.22	74.27	46.10

The area under cane increased by 7.7% to 7,286.85 Ha from 6,763.22 Ha reported in December 2020. The reduction in cane area was both in the nucleus and Outgrower sectors arising from ploughing out of advanced ratoons after harvesting.

The yields increased from 46.10 Tc/Ha in 2020 to 74.27 Tc/Ha reported in 2021.

9.2. Area under cane by Crop Classes

Table 37: Area under Crop Classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	1,212.65	983.60	2,196.25	30
R1	888.97	453.00	1,341.97	18
R2	884.97	757.55	1,642.52	23
R3+	446.91	1,659.20	2,106.11	29
TOTAL	3,433.50	3,853.35	7,286.85	100

The crop cycles PC: R1:R2: R3+ ratio was 30:18:23:29 against the industry standard of 30:30:30:10 for sustainable cane supply. The proportion of plant crops has improved from the previous year, indicative of cane development.

We recommend replacement of the advanced ratoons through further development.

9.3. Area under cane by varieties

Table 38: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	2,677.42	2,103.48	4,780.90	65.61
CO 945	0.00	123.10	123.10	1.69
D 84 84	0.00	8.48	8.48	0.12
CB 38/22	0.00	8.83	8.83	0.12
N 14	0.00	115.62	115.62	1.59
KEN 83-737	101.53	69.42	170.95	2.35
KEN 82 808	611.87	1,240.22	1,852.09	25.42
Mixed	42.68	184.20	226.88	3.11
TOTAL	3,433.50	3,853.35	7,286.85	100.00

The varieties mix was satisfactory and popular varieties were – Co 421 (66%), KEN 82 808 (25%), KEN 83 737 (2%), N 14 (2%), Co 945 (2%) and Mixed (3%) in small proportions.

Adoption of the local bred varieties was quite impressive at 27% in the zone though it presented a decrease of 25.6% from 36.29%.

9.4. Area under cane by crop ages

Table 39: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 7	497.83	1,293.54	1,791.37	24.58
8-13	2,392.13	2,186.98	4,579.11	62.84
14+	543.53	372.83	916.36	12.58
TOTAL	3,433.49	3,853.35	7,286.84	100.00

The proportion of cane at age cluster 14+months was at 12.58 % indicative of increased mature cane availability from a low of 0.09% in the previous year.

9.5. Cane availability projections

9.5.1. Cane projection - December 2021 - June 2022

Harvesting age at the Coast -14 months for Plant cane and 12 months for ratoon crops;

Cane age available = 8 months and above;
 Area under cane available = 4579.11 + 916.36 Ha
 Cane available = 5,495.47 Ha x 74.27 Tc/Ha = 408,150
 Mill requirement at 3,000 TCD = 132 days' x 3,000 TCD = 396,000Tc
Cane supply status = 408,150.52 – 396,000 Tonnes
 = **12,151 Tonnes**

We project a surplus in cane supply by June 2021.

9.5.2. Cane projection - 2022/2023

Cane age available = (0 -7) + (PC+IR+2R) 8+ months
 Area under cane available = (1,791.37 + 916 + 4,579) Ha
 Cane available = (7,287 Ha x 74.27 Tc/Ha) + 12,151
 = 541,196.21+12,151 Tonnes.
 = 553,356.49
 Mill requirement at 3,000 TCD = 267 days' x 3,000 TCD =801,000 tonnes
Cane supply deficit = 533,356.49 – 801,000 Tonnes = **(259,804)**
tonnes

We project a cane supply deficit of 259,804 tonnes by June 2023 therefore recommend synchronized cane planting for sustainable cane supply.

9.6. Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Land without title deed	Securing title deed with the help of County administration	
Stay away landlords from their cane farm land	Outgrower department is in close contact with their local representatives	
Inadequate infrastructure development in the Out grower area; roads, culverts, bridges & drainage structures, electricity	The company is using all opportunities to address the subject with the county authorities	
High cost of developing virgin land, inputs	Seeking subsidy support from the Government	
Soil moisture stress especially in the dry season of the year	Introduction of irrigation in the Outgrower and expanding in the Nucleus Estate,	
Farmers low adoption of proper seed cane selection	Create farmer awareness on use of certified seedcane	

10.0. MUHORONI SUGAR COMPANY

10.1. Area under cane

10.1.1. Area under cane by Counties

Table 40: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	AREA UNDER CANE IN HECTARES			NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% AREA COVERAGE
		OUT GROWERS	NUCLEUS ESTATE	TOTAL			
KISUMU	MUHORONI	4,474.94		4474.94	4351	1.29	29.84
	NYANDO	3,019.15	283.29	3302.44	2896	0.97	22.02
	SUB TOTAL	7,494	283	7,777	7,247	1.07	51.86
KERICHO	KIPKELION	2,804		2804	2235	1.25	18.70
	AINAMOI	659.45		659.45	574	1.15	4.40
	SOIN/SIGOWE T	2,185.08	741.24	2,926.32	2,706	1.08	19.51
	SUB TOTAL	5,648.53	741.24	6,389.77	5,515.00	1.16	42.61
NANDI	TINDERET	828.49		828.49	1941	0.43	5.52
	SUB TOTAL	828.49		828.49	1941	0.43	5.52
TOTAL		13,971	1,025	14,996	14,703	1.02	100.0

The cane area for Muhoroni sugar Company Ltd. was spread in the counties of – Kisumu (52%), Kericho (42 %) and Nandi (6%).

10.1.2. Area under cane by sector and yields

Table 41: Area under cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	13,971.08	12,713.34	62.61	50.41
NUCLEUS	1,024.55	953.07	64.08	30.80
TOTAL	14995.63	13,666.41	62.96	48.48

The area under cane increased slightly from 13,666.41 Ha in December 2020 to 14,995.63 Ha in 2021. This was as a result of enhanced cane development in the zone.

The yields increased from 48.48Tc/Ha in 2020 to 62.96 Tc/Ha in 2021, this may be attributed to the favourable rains during the period.

Area under cane by crop classes

Table 42: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	2,183.57	455.84	2,639.41	17.60
R1	3,283.96	190.47	3,474.43	23.17
R2	2,379.02	84.42	2,463.44	16.43
R3+	6,124.53	293.41	6,417.94	42.80
TOTAL	13,971.08	1,024.14	14,995.22	100

The crop cycles PC: R1:R2: R3+ ratio was 18:23:16:43 against the industry standard of 30:30:30:10 for stable cane supply. There is need to enhance cane development in the zone.

10.2. Area under cane by varieties

Table 43: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	1,360.70	0	1360.7	9.07
CO 945	526.68	15.17	541.85	3.61
CO 617	11,074.51	749.18	11823.69	78.85
CO 1148	3.20	4	7.2	0.05
D 84 84	8.20	0.41	8.61	0.06
CB 38/22	369.12	150.46	519.58	3.46
N 14	19.30	1	20.3	0.14
KEN 83-737	571.20	51.5	622.7	4.15
CO 331	15.60	0	15.6	0.10
EAK 90 97	1.90	0	1.9	0.01
EAK 73 335	2.90	0	2.9	0.02
KEN 82 808	3.57	0	3.57	0.02
KEN 82 216	5.20		5.2	0.03

KEN 82 472	0.60	0	0.6	0.00
Others	8.40	4.76	13.16	0.09
Mixed	0	48.07	48.07	0.32
TOTAL	13971.08	1024.55	14995.63	100

The popular, dominant variety was Co 617 occupied 79% of the total cane area. Others were Co 421 (9%), KEN 83 737 (4%), CB 38 22 (3%), Co 945 (3%) and others were less than 1%.

We **recommend** an expanded variety mix to include more improved early maturing varieties and reduce the proportion under CO 617.

10.3. Area under cane by crop ages

Table 2344: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	3,255.02	527.90	3,782.92	25.23
7 -12	5,283.07	326.01	5,609.08	37.40
13-18	3,854.93	155.90	4,010.83	26.75
19+	1,578.06	14.74	1,592.80	10.62
TOTAL	13,971.08	1,024.55	14,995.63	100

The proportion of cane that was 19+ months was 11% signifying over mature cane in the zone at the time of the survey.

10.4. Cane availability projections

10.4.1. Cane projection - Dec 2021 - June 2022

i) Muhoroni catchment

Cane age available = 13 months and above
Area under cane available = 5,603.63 Ha
Cane available = 5,603.63 Ha x 63 Tc/Ha
= 353,028.7 tonnes

ii) Miwani Nucleus

40% of Miwani Nucleus cane will be supplied to Muhoroni factory for milling

Cane available = 13 months and above

Area under cane available = 593.69 Ha x 30.34 Tc/Ha

= (18,012.55 x 0.4) Tc = 7,205.02 Tc

Total available cane (i + ii) = 353,028.7 tonnes + 7,205.02 = 360,233

Mill requirement at 2,200 TCD = 164 days' x 2,200 TCD = 360,800 tonnes

Cane supply deficit = 360,233 – 360,800 = **(567) tonnes**

We projected a cane supply deficit of (567) tonnes by end of June 2022.

10.4.2. Cane projection - 2022/2023

i) Muhoroni catchment

Cane age available = (0 -12) + (PC +R1 + R2) 19+ months

Area under cane available = 10,985 Ha

Cane available = 10,985 Ha x 63 Tc/Ha

= 692,042.4 tonnes

ii) Miwani Nucleus

Available cane = (0-12) + (PC +R1+R2, 19+) months

= 1408.59 Ha

Cane available = 1408.59 Ha x 30.34 Tc/Ha

= (42,736.62 x 0.4) tonnes = 17,094.65 tonnes.

Total Cane available (i + ii) = (353,028.7 tonnes

+ 17,094.65 = 370,123.35 Tc

Mill requirement at 2,200TCD = 280 days' x 2,200 TCD = 616,000 tonnes

Cane supply deficit = (370,123 - 616,000) tonnes

= **(245,877) tonnes**

We project a cane supply deficit of (245,877) tonnes by June 2022 after including the 40% of Miwani Nucleus cane production.

10.5. Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
High cost of farm inputs	County to consider supporting farmers with subsidized fertilizer	Federation to lobby County governments to allocate more funds to agriculture ministry vote
High cost of cane maintenance	Pursue cost reduction strategies and technologies including minimum tillage and single eye bud seed cane.	Sugar directorate to do the Sugar industry cost benefit analysis and share the recommendations
Inadequate machinery for land development	Review and develop asset replacement/ management policy	Reinstatement of the Sugar Development Fund
Poor road network in the zone	Liaise with the appropriate stakeholders	
Delayed farmers payment	Implement sugar regulation policy on timely payment	Government to support farmers payment arrears

11.0. MIWANI NUCLEUS ESTATE

11.1. Area under cane

11.1.1. Area under cane by Counties

Table 45: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	AREA UNDER CANE (HA)			NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% AREA COVERAGE
		OUTGROWERS	NUCLEUS ESTATE	TOTAL			
KISUMU	MUHORONI	0	1615.3	1615.3	1	-	100.00
	SUB TOTAL	0	1615.3	1615.3	1	-	100.00
TOTAL		0	1615.3	1615.3	1	-	100.00

The Miwani Nucleus Estate is in Muhoroni Sub –County, Kisumu County.

11.1.2. Area under cane by sector and yields

Table 2446: Area under cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	0	0	0	0
NUCLEUS	1,615.30	1,909.52	30.34	34.49
TOTAL	1,615.30	1,909.52	30.34	34.49

The area under cane declined by 15% to 1,615.30 Ha from 1,909.52 Ha reported in December 2020. This reflects low cane development activities in the zone.

We project a 12% decrease in yield to 30.34 Tc/Ha from 34.49 Tc/Ha realized in 2020. The projected yield of 30.34 Tc/Ha is significantly low compared with the industry projected average yield of 68.85 Tc/Ha. This could be due to inadequate resources for cane development in the zone.

11.2. Area under cane by crop classes

Table 2547: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	0	139.54	139.54	8.64
R1	0	90.38	90.38	5.60
R2	0	264.38	264.38	16.37
R3+	0	1,121	1,121	69.40
TOTAL	0	1,615.30	1,615.30	100

The crop cycles PC: R1:R2: R3+ ratio was 9:6:16:69 against the industry standard of 30:30:30:10 for stable cane supply. The lower proportion of plant crop and higher proportion of R3+ could be due to low cane development activities in the zone over time.

11.3. Area under cane by varieties

Table 2648: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 617	0.00	688.45	688.45	42.62
CB 38/22	0.00	340.77	340.77	21.10
EAK 90 97	0.00	320.00	320.00	19.81
Mixed	0.00	114.83	114.83	7.11
KEN 83-737	0.00	85.96	85.96	5.32
CO 945	0.00	65.29	65.29	4.04
TOTAL	0	1,615.3	1,615.3	100.00

The popular varieties were; CO 617 (43 %) and CB 38/22 (21 %), EAK 90 -97 (20 %), Mixed (7 %), KEN 83 -737 (5 %) and Mixed (4 %).

The varieties were adequately diversified however, we **recommend** review to include early, medium and late maturing varieties in the varieties pool.

11.4. Area under cane by crop ages

Table 49: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	0	613.37	613.37	37.97
7 -12	0	408.22	408.22	25.27
13-18	0	206.69	206.69	12.80
19+	0	387.02	387.02	23.96
TOTAL	0	1,615.30	1,615.30	100

The proportion of 19+ months old cane was 24% indicative of over mature cane in the zone.

11.5. Cane availability projections

11.5.1. Cane projection - Dec 2020 - June 2021

Miwani Nucleus

Cane age available = 13 months and Ha above
 Cane available = 593.69Ha x 30.34 Tc/Ha
 = **18,012.55 tonnes**

11.5.2. Cane projection - 2021/2022

Available cane = (0-12) + (PC +R1+R2, 19+) months
 = 408 +613 +109 Ha
Cane available =1,130 Ha x 30.34 Tc/Ha
 = **34,293 tonnes**

NB: Miwani Nucleus Estate will supply cane to Muhoroni (40%) and Kibos (60%) sugar factories for milling.

11.6. Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Untimely payment of cane proceeds	Implement Sugar regulations	
Inadequate farm machineries	Reinstate the Sugar Development Fund	
Inadequate supply of newly released seed cane varieties	KALRO-SRI to collaborate with mills in establishment of nurseries at respective mills	
Poor ratoon ability of newly released varieties	Improve crop husbandry practices especially during harvesting and KALRO-SRI to map the varieties based on ecological zones.	
Untimely cane harvesting programme	Synchronize cane supply and demand	
Poor road network	Review regulations on cess	
Erratic rainfall pattern	Consider irrigation	

12.0. KIBOS SUGAR AND ALLIED INDUSTRIES LTD.

12.1. Area under cane

12.1.1. Area under cane by Counties

Table 2750: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	AREA UNDER CANE IN HECTARES			NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% AREA COVERAGE
		OUTGROWERS	NUCLEUS ESTATE	TOTAL			
KISUMU	MUHORONI	4998.79	0	4998.79	2940	1.70	62.05
	MUHORONI	0	651.01	651.01	1	2.50	8.08
	NYANDO	505.51	0	505.51	337	1.50	6.27
	KISUMU EAST	575.76	0	575.76	504	1.14	7.15
	KISUMU WEST	6.60	0	6.6	4	1.65	0.08
	SUB TOTAL	6,086.66	651.01	6,738	3,786	1.70	83.63
SIAYA	UGENYA	30.98	0	30.98	50	0.62	0.38
	SUB TOTAL	30.98	0	30.98	50	0.62	0.38
KAKAMEGA	BUTERE	40.34		40.34	45	0.71	0.50
	MUMIAS EAST	8.34		8.34	7	1.19	0.10
	LURAMBI	2.71		2.71	1	2.71	0.03
	SUB TOTAL	51.39	0	51.39	53	1.54	0.64
NANDI	TINDERET	997.40	0	997.4	556	1.79	12.38
	ALDAI	122.05	0	122.05	101	1.21	1.51
	SUB TOTAL	1,119.45	0	1,119.45	657	1.5	13.90
KERICHO	SIGOWET-Soin	116.62	0	116.62	47	1.16	1.45
	SUB TOTAL	116.62	0	116.62	47	1.16	1.45
TOTAL		7405.10	651.01	8056.11	4593	1.49	100

The area under cane was spread in the Counties of Kisumu (84%), Nandi (14%), Kakamega (0.64 %), Siaya (0.4 %) and Kericho (1.4 %).

12.1.2. Area under cane by sector and yields

Table 51: Area under cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TC/HA)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	7405.11	6,743.5	69.15	68.82
NUCLEUS	651.01	635.51	80.11	78.46
TOTAL	8056.12	7,379.01	70.37	67.50

The area under cane increased by 9% to 8,056 Ha from 7,379.01 reported in December 2020. This was due to increased cane area in the Out growers.

We project an 2% increase in yield to 70.37Ha from 67.50 Tc/Ha realized in 2020. This appreciation in productivity could be two-fold, good rains received in 2021.

Area under cane by crop classes

Table 52: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	1,336.11	89.55	1,425.66	17.70
R1	2,388.57	165.25	2,553.82	31.70
R2	2,542.21	114.54	2,656.75	32.98
R3+	1,138.22	281.67	1,419.89	17.62
TOTAL	7,405.11	651.01	8,056.12	100

The crop cycles PC: R1:R2: R3+ ratios was 18:32:33:17 against the industry standard of 30:30:30:10 for stable cane supply. The low proportion of plant crop was due to minimal cane development activities in the zone during the year 2021.

We **recommend** cane development be sustained over time to achieve cane area commensurate with a 3,000 TCD factory.

12.2. Area under cane by varieties

Table 53: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	43.28	1.34	44.62	0.55
CO 945	2.58	0	2.58	0.03
CO 617	4,011.97	368.05	4380.016	54.37
CO 1148	157.78	0	157.78	1.96
D 84 84	23.10	0	23.1	0.29
CB 38/22	582.19	131.77	713.96	8.86
N 14	20.12	8.22	28.34	0.35
KEN 83-737	976.90	77.66	1054.56	13.09
CO 331	249.90	0	249.9	3.10
KEN 82 216	0.00	2.96	2.96	0.04
KEN 82 472	4.00	5.41	9.41	0.12
Others	1,284.59	18.92	1303.51	16.18
Mixed	48.69	36.68	85.37	1.06
TOTAL	7405.10	651.01	8056.11	100

The popular variety was C0617 (54%) followed by KEN 83-737 (13%), CB 38-22 (9%), CO331 (3%), CO1148 (2%), and others (19%).

We **recommend** the proportion of the dominant variety CO 617 be scaled down during the review and increase the proportions of other varieties.

12.3. Area under cane by crop ages

Table 54: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	1,554.45	181.28	1735.73	21.55
7 -12	2,430.42	156.20	2586.622	32.11
13-18	1,663.93	132.08	1796.01	22.29
19+	1756.294	181.45	1937.744	24.05
TOTAL	7405.10	651.01	8056.11	100

The cane crop age in the cluster 19+ months was high at 24% an indication of mature cane in the zone.

12.4. Cane availability projections

12.4.1. Cane projection - Dec 2021 – June 2022

i) Kibos catchment

Cane age available = 13 months and above
Area under cane available = 3,733.754 Ha
Cane available = 3,733.754 Ha x 70.37 Tc/Ha
= 262,744 tonnes

ii) Soin catchment

Cane age available = 13 months and above
Area under cane available = 1018 Ha
Cane available = 1018 Ha x 62.35 Tc/Ha = 63,472.3 tonnes.

iii) Miwani Nucleus

60% of cane from Miwani Nucleus will be supplied to Kibos Sugar and Allied Industries

Cane available = 13 months and above
Area under cane available = 594 Ha x 30.34 Tc/Ha
= (18021.96 x 0.6) Tc = 10,813.18 tonnes

Total cane available (i+ ii + iii) = 337,029.48

Mill cane requirement

At 3,000 TCD- 164 days' x 3,000 TCD = 492,000 tonnes

Cane supply Deficit = 337,029.48 - 492,000 = (154,970.52) tonnes

After inclusion of cane supply from Soin and Miwani Nucleus catchments, we project a cane supply deficit of **(154,970.52) tonnes** by June 2022.

12.4.2. Cane projection - 2022/2023

i) Kibos catchment

Cane age available = (0 -12) + (PC + R1 +R2)19+ months
Area under cane available = 5919 Ha
Cane available = 5919Ha x 70.37 Tc/Ha
= 416,520 - 154970.52 tonnes
= 261,549.51 Tc

ii) Soin catchment

Cane age available = (0 -12) + (PC, R1 & R2) 19+months
Area under cane available = 717 Ha + 984 Ha + 78 Ha
Cane available = 1,779 Ha x 67.67Tc/Ha = 120,390.50 tonnes.

iii) Miwani Nucleus

Available cane = (0-12) + (PC +R1+R2, 19+) months
= 1130 Ha
Cane available = 1130 Ha x 30.34 Tc/Ha
= (34284.2 x 0.6) tonnes = 20,570.52 tonnes

Total cane available (i +ii + iii) = 402,510.53 Tonnes

Mill requirement at 3,000TCD = 280 days' x 3,000 TCD
= 840,000 tonnes
Cane Supply Deficit = 402,510.53 – 840,000 tonnes
= **(437,489.47) tonnes**

With the inclusion of cane supplies the Soin catchment, we project a cane supply deficit of (437,487.47) tonnes by June 2023.

Kibos will experience the highest **cane deficit** in the industry during the period under review.

To improve cane supply to the factory in future, we **recommend:**

- i) Factory operations be adjusted to avoid milling young cane projected to be available in the subsequent season;
- ii) Rigorous cane development initiatives to increase the cane area commensurate with a 3,000 TCD plant; and
- iii) Adopt and sustain yield enhancement initiatives.

12.5. Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
High cost of land preparation in the lowland areas i.e. at Approx. Kshs. 46,050 per Ha.	Adopting conservational rather than conventional tillage where possible	Cost saving strategy
High cost of herbicides during pre -emergence and early post emergence i.e at Approx. Kshs. 18,700 per Ha.	Advising farmers on farming systems i.e crop rotation which alter seasonal emergence of stubborn weeds. Government to subsidize cost of these inputs	
Lack of access to high quality seed-cane and improved cane varieties.	Collaborate with AFA and Sugar Research Institute to multiply improved varieties and establish seed-cane nurseries	KALRO-SRI to provide certified seed-cane
Poor adaptability of improved varieties and dominance of a single variety i.e CO 617 in the lowlands.	Collaborate with AFA and Sugar Research Institute to undertake more adaptive research and demos in the lowlands.	Research-mill-farmer program
Majority (80%) of the catchment is in the lowland areas and prone to flooding and inaccessible. This renders the harvesting program weather dependent.	Signed an MOU with the County Government of Kisumu on roads repair and maintenance.	A few roads have been done under this arrangement.
Poor regeneration of ratoons in the lowlands due to trampling on stools and compaction of soil during harvesting.	Implementing harvesting program which targets lowlands during dry season and uplands during wet seasons. Introduction of stack harvesting to minimize loaders trampling/stool destruction	
Seasonal labour	Engaging labour in other crop maintenance activities alternately during off-peak.	It is often difficult to retain labour in this arrangement.
(Inadequate labour availability due to emerging enterprises)	To introduce incentives / bonuses to retain labour	
Continued subdivision of sugarcane plots to uneconomic sizes	Strengthening our extension support to advise farmers that sugarcane thrives on economies of scale.	Farmers continue to sub-divide sugarcane plots

Poor trash management in the lowland areas.	Collaborate with AFA Sugar Research Institute to find sustainable approach from the usual burning.	Termite activity is low hence mulching is not effective.
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13.0. WEST KENYA SUGAR ZONE

13.1. Area under cane

13.1.1. Area under cane by Counties

Table 55: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROW ERS (HA)	TOTAL (HA)	NO. OF GROW ERS	AVERAGE CANE PLOT SIZE (HA)-OG	% COVERAGE
KAKAMEGA	BUTERE	476	476.23	798	0.60	0.81
	KAKAMEGA CENTRAL	4,128	4,128.13	6,341	0.65	7.01
	KAKAMEGA EAST	2,282	2,282.16	5,860	0.39	3.87
	KAKAMEGA NORTH	8,752	8,752.19	19,865	0.44	14.85
	NAVAKHOL O	3,935	3,934.92	7,520	0.52	6.68
	LIKUYANI	204.18	204.18	170	1.20	0.35
	LUGARI	3,078	3078.16	2999	1.03	5.22
	MUMIAS WEST	152.28	152.28	220	0.69	0.26
	MATUNGU	1,363	1,363.15	2,013	0.68	2.31
	MUMIAS EAST	1,542.13	1,542.13	2,501	0.62	2.62
	SUB-TOTAL	25,913.53	25,913.53	48,287	0.54	43.98
BUNGOMA	BUNGOMA CENTRAL	524.17	524.17	990	0.53	0.89
	BUNGOMA EAST	3,709.15	3,709.15	9,200	0.40	6.29
	BUNGOMA NORTH	5,197.99	5,197.99	5,602	0.93	8.82
	BUNGOMA SOUTH	1,462.66	1,462.66	2,940	0.50	2.48
	BUNGOMA WEST	601.23	601.23	982	0.61	1.02
	KIMILILI	1,187.16	1,187.16	2,620	0.45	2.01
	KOPSIRO	81.29	81.29	175	0.46	0.14
	MT ELGON	310.54	310.54	621	0.50	0.53
	SIRISIA	154.13	154.13	255	0.60	0.26
TONGAREN	4,187.14	4,187.14	4,105	1.02	7.11	

	SUB-TOTAL	17,415.46	17,415.46	27,490	0.63	29.55
KERICHO	KERICHO	582.35	582.35	861	0.68	0.99
	KIPKELION WEST	610.18	610.18	962	0.63	1.04
	SUB-TOTAL	1,192.53	1,192.53	1,823	0.65	2.02
KISUMU	KISUMU EAST	61.28	61.28	81	0.76	0.10
	MUHORON I	632.18	632.18	723	0.87	1.07
	NYANDO	350.18	350.18	456	0.77	0.59
	SUB-TOTAL	1,043.64	1,043.64	1,260	0.83	1.77
NANDI	KABIYET	355.67	355.67	310	1.15	0.60
	NANDI CENTRAL	287.91	287.91	223	1.29	0.49
	NANDI NORTH	1,086.87	1,086.87	632	1.72	1.84
	NANDI SOUTH	654.23	654.23	436	1.50	1.11
	TINDERET	678.19	678.19	587	1.16	1.15
	SUB-TOTAL	3,062.87	3,062.87	2,188	1.40	5.20
TRANS NZOIA	KIMININI	2,241.94	2,241.94	1,132	1.98	3.80
	TRANSNZOIA EAST	198.18	198.18	38	5.22	0.34
	KWANZA	2,785.16	2,785.16	413	6.74	4.73
	SABOTI	1,302.60	1,302.60	188	6.93	2.21
	ENDEBESI	865.93	865.93	235	3.68	1.47
	SUB-TOTAL	7,393.81	7,393.81	2,006	3.69	12.55
UASIN GISHU	TURBO	2,341.89	2,341.89	923	2.54	3.97
	SUB-TOTAL	2,341.89	2,341.89	923	2.54	3.97
VIHIGA	HAMISI	562.13	562.13	1,051	0.53	0.95
	SUB-TOTAL	562.13	562.13	1,051	0.53	0.95
TOTAL		58,925.86	58,925.86	85,028	0.69	100.00

The raw material catchment for West Kenya Sugar Company Ltd. was expansive covering the Counties of, Kakamega (44%), Bungoma (30%), Transzoia (12%), Nandi (5%), Kisumu (2%), Uasin Gishu (4%), Kericho (2%) and Vihiga (1%).

13.1.2. Area under cane by sector and yields

Table 56: Area under cane by sector and yields

	AREA UNDER CANE (HA)		CANE YIELD (TCH)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	58,925.86	48,970.29	68.74	66.97
NUCLEUS	0	0	0	0
TOTAL	58,925.86	48,970.29	68.74	66.97

The area under cane increased by 20% to 58,925.29 Ha from 48,970.29 Ha recorded in December 2021.

We project an increase in productivity by 3% to 68.74 Tc/Ha from 66.97 Tc/Ha achieved in 2020. This could be due to good management practices and good rains received during its growth stages. The miller supplied fertilizers to growers during the year under review.

13.2. Area under cane by crop classes

Table 57: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	24,361.07		24,361.07	41.34
R1	23,550.52		23,550.52	39.97
R2	10,481.35		10,481.35	17.79
R3+	532.92		532.92	0.90
TOTAL	58,925.86	-	58,925.86	100

The crop cycles ratio PC: R1:R2: R3+ was 41:40:18:1 against the industry standard of 30:30:30:10 for stable cane supply. The high proportion of plant crop (41%) was indicative of enhanced cane development activities in the zone.

We **recommend** sustenance of cane planting initiatives and yield enhancement programs.

13.3. Area under cane by varieties

Table 58: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	32,414.13		32,414.13	55.01
CO 945	17,398.81		17,398.81	29.53
CO 617	22.50		22.50	0.04
N 14	398.42		398.42	0.68
KEN 82 472	442.86		442.86	0.75
FR 95 2345	1,242.65		1,242.65	2.11
Mixed	7,006.49		7,006.49	11.89
TOTAL	58,925.86	-	58,925.86	100

The popular variety was CO 421, (55%) followed by CO 945 (30%) and others 15%. Adoption of the local improved varieties was still low in the zone.

We **recommend** adoption of a variety diversification program to scale down on the proportion of CO 421 in the zone.

13.4. Area under cane by crop ages

Table 59: Area under cane by ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 – 6	20,998.40		20,998.40	35.64
7 -12	12,228.63		12,228.63	20.75
13-18	17,771.43		17,771.43	30.16
19+	7,927.40		7,927.40	13.45
TOTAL	58,925.86	-	58,925.86	100

The sugarcane crop at 19+ months old represented 13% of the cane surface and was indicative of delayed harvesting of mature cane in the zone.

13.5. Cane availability Projections

13.5.1. Cane Projection - Dec 2021- June 2022

Cane age available = 13 months and above

Area under cane available = 25,698 Ha

Cane available = 25,698 Ha x 0.85* x 68.74 Tc/Ha

(*Correction factor of 0.15 for overlapping in area with Butali Sugar Mills)

= 1,501,508 tonnes

Mill requirement at 6,500 TCD = 164 days' x 6,500 TCD = 1,066,000 tonnes

Cane supply surplus tonnes = 1,501,544.92 – 1,066,000 = 435,545

We project a cane supply surplus of 435,545 tonnes by June 2022.

13.5.2. Cane Projection -2022/2023

Cane age available = (0 -12) + (PC +R1+R2)19+ months

Area under cane available = 20,998 +12,229+7,927 Ha

Cane available = 41,154 Ha x 0.85 x 68.74 Tc/Ha + 435,545 Tonnes
 = 2,404,592 +(435,545) *0.85 tonnes
 = 2,774,806.11 tonnes

Mill requirement at 6,500 TCD = 310 days' x 6,500 TCD = 2,015,000 tonnes

Cane supply surplus = 2,774,806 – 2,015,000 = 759,806 **tonnes**

We project a cane supply surplus of 759,806 tonnes by June 2023.

In the event that Naitiri Unit mill operations begin milling, the anticipated West Kenya cane surplus will be channelled to Naitiri.

Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Delayed cane harvesting	Synchronize cane supply and mill demand Farmer sensitization on need of early cane contracting	

14.0. MUMIAS SUGAR COMPANY LTD.

14.1. Area under cane

14.1.1. Area under cane by Counties

Table 60: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUT GROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NUMBER OF GROWERS	AVERAGE PLOT SIZE	% COVERAGE
KAKAMEGA	MUMIAS EAST	0	257.25	257.25	-	-	93.92
	MATUNGU	0	2.27	2.27	-	-	0.83
	MUMIAS WEST		14.37	14.37	-	-	5.25
	SUB-TOTAL	0	273.89	273.89	-	-	100
TOTAL		0	273.89	273.89	-	-	100

Mumias Sugar Company Nucleus Estate is in Kakamega County in the sub Counties of Mumias East (94%), Mumias West (5%) and Matungu (1%).

14.1.2. Area under cane by sector and yields

Table 61: Area under cane by sector and yields

	AREA UNDER CANE (HA)		CANE YIELD (TCH)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	0	0	0	0
NUCLEUS	273.89	198.00	22.06	N/A
TOTAL	273.89	198.00	22.06	N/A

The area under cane in the Nucleus Estate remained low at 273.89 Ha compared with 197.884 Ha recorded in December 2020. The surface of 3,189.98 Ha remained fallow in the course of the year.

The projected yield of 22.06 Tc/Ha was low compared with the industry projected yield of 68.85 Tc/Ha.

14.2. Area under cane by crop classes

Table 62: Area under cane by crop cycle

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	0	0	0	0.00
R1	0	2.27	2.27	0.83
R2	0	20.68	20.68	7.55
R3+	0	250.95	250.95	91.62
TOTAL	0	273.89	273.89	100

The crop cycles ratio PC: R1:R2: R3+ was 0:1:7:92 against the industry standard of 30:30:30:10 for stable cane supply. The high ratoon cane ratio (100%) was indicative of lack of cane development activities in the zone during the year under review.

14.3. Area under cane by varieties

Table 63: Area under cane by Variety

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 617		60.67	60.67	22.15
KEN 83-737		21.19	21.19	7.73
EAK 73 335		141.63	141.63	51.70
KEN 82 601		22.73	22.73	8.30
FR 95 2345		27.73	27.73	10.12
TOTAL	0	273.95	273.95	100

When cane Planting resumed in 2019 the emphasis was on local improved early maturing varieties. The varieties position was CO 617 (22.15%), KEN 83 737 (7.73), EAK 73 335 (51.70%), KEN 82 601(8.3%), and FR 95 2345 (10.12%)

As cane planting continues, we recommend more varieties be brought on board to include early, medium and late maturing types.

14.4. Area under cane by crop ages

Table 64: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	0	0	0	0.00
7 -12	0	154.81	154.81	56.52
13-18	0	27.301	27.301	9.97
19+	0	91.78	91.78	33.51
TOTAL	0	273.89	273.89	100

There was no cane within the age bracket of 0-6 months, indicating negligible cane development activities in the zone.

Cane availability Projections

14.4.1. Cane Projections - Dec 2021 - June 2022

Cane age available = 13 months and above
 Area under cane available = 119 Ha
 Cane available = 119 Ha x 22.06 Tc/Ha = 2,625 tonnes.
 Mill cane requirement at = **NIL (Factory will remain closed)**
Cane supply status = **2,625 tonnes** (Will be milled by neighbouring factories)

14.4.2. Cane Projections 2022/2023

Cane age available = (0 -12) + (PC+R1+R2)19+ months
 Area under cane available = 21 +155 Ha
 Cane available = 176 Ha x 22.06 Tonnes = 3,882.56 tonnes
 Mill cane requirement - = **NIL (Factory will remain closed)**
Cane supply status = **3,882+ 2,625 (surplus) tonnes =6,498 tonnes**
 The available cane will be supplied to the neighbouring mills.

14.5. Cane production constraints in the zone & possible mitigation

Constraint	Mitigation	Remarks
Cane poaching	Beefing up security	Total security has been brought on board
Financial constraint	KCB is in the process of looking for an investor	KCB is sourcing for an investor
Cane Fire	Beefing up security	Total security has been brought on board

15.0. OLEPITO UNIT

15.1. Area under cane

15.1.1. Area under cane by Counties

Table 65: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)	% AREA COVERAGE
BUSIA	TESO SOUTH	3664.18	6.4	3670.58	3796	0.97	37.83
	TESO NORTH	820	0	820	620	1.32	8.45
	BUTULA	873	0	873	1271	0.69	9.00
	MATAYOS	639	0	639	756	0.85	6.59
	NAMBALE	2,146.00	0	2146	2,873	0.75	22.12
	SUB-TOTAL		8142.18	6.4	8148.6	9316.0	0.87
BUNGOMA	BUMULA	866	0	866	868	1	8.93
	SUB-TOTAL	866	0	866	868	1	8.93
SIAYA	UGUNJA	390	0	390	182	2.14	4.02
	SUB-TOTAL	308	0	308	168	2.14	3.35
KAKAMEGA	MATUNGU	298	0	298	334	0.89	3.07
TOTAL	SUB-TOTAL	298	0	298	334	0.89	3.59
		9,696.18	6.40	9,702.58	10,700	0.91	100.00

The raw material catchment for West Kenya Olepito unit is in the Counties of Busia (84%), Bungoma (9%), Siaya (4%) and Kakamega (3%).

15.1.2. Area under cane by sector and yields

Table 66: Area under cane by sector and yields

	AREA UNDER CANE (HA)		CANE YIELD (TCH)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	9,696.18	9,173.88	60.19	46.62
NUCLEUS	6.40	11.2	48.00	N/A
TOTAL	9,702.58	9,185.08	60.17	46.62

The area under cane increased marginally by 5.63% to 9,702.58 Ha from 9,185.08 Ha registered in December 2020. This could be attributed to enhanced cane development activities in the zone.

Cane yield was projected at 60.17 Tc/Ha, an increase of 29.06% from 46.62 Tc/Ha realized in 2020. The projected higher yield could be attributed to improved cane husbandry practices. It is worth noting that a substantial surface area under cane in Busia is generally leased by growers who embrace cane farming as a business.

15.2. Area under cane by crop classes

Table 67: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	2,389.33	0.60	2,389.93	24.60
R1	3,625.12	5.80	3,630.92	37.40
R2	2,174.40	-	2,174.40	22.40
R3+	1,507.33	-	1,507.33	15.60
TOTAL	9,696.18	6.40	9,702.58	100

The crop cycles PC: R1:R2: R3+ ratios were 25:37:22:16 against the industry standard of 30:30:30:10 for sustainable cane supply. The high proportion of ratoon 3+ should be managed through replanting of fields under advanced ratoons (R3+).

15.3. Area under cane by varieties

Table 68: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	1,319.80	-	1,319.80	13.60
CO 945	8,243.06	6.40	8,249.46	85.02
D 84 84	28.60	-	28.60	0.29
KEN 83-737	17.40	-	17.40	0.18
EAK 73 335	5.68	-	5.68	0.06
Others	22.72	-	22.72	0.23
Mixed	58.92	-	58.92	0.61
TOTAL	9,696.18	6.40	9,702.58	100

The popular variety was CO 945 which covered 85% of the cane area followed by CO 421 at 14% and others at 1%. There is a need to promote improved locally bred varieties in the zone to counter the dominance of CO 945.

15.4. Area under cane by crop ages

Table 69: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 – 6	2,546.30	0.60	2,546.90	26.25
7 -12	3,055.64	-	3,055.64	31.49
13-18	2,677.40	5.80	2,683.20	27.65
19+	1,416.84	-	1,416.84	14.60
TOTAL	9,696.18	6.40	9,702.58	100

The proportion of cane 19+ months old was 15% indicative of over mature cane in the zone at the time of the survey.

15.5. Cane availability Projections

15.5.1. Cane Projection - Dec 2021- June 2022

Cane age available	= 13 months and above
Area under cane available	= 153+1263+2683= 4,099 Ha
Cane available	= 4,099 Ha x 60.17 Tc/Ha = 246,700.58 tonnes
Mill requirement at 750 TCD	= 164 days' x 750 TCD = 123,000 tonnes
Cane supply surplus	= 246,700.58 – 123,000 = 123,701 tonnes

We project a cane supply surplus of 123,701 tonnes by June 2022.

15.5.2. Cane Projection - 2022/2023

Cane age available = (0 -12) + (PC+R1+R2) 19+ months
 Area under cane available = (3056+2547+1263) = 6,866 Ha
 Cane available = (6,866 Ha x 60.17 Tc/Ha + 123,636.83) tonnes
 = 536,824.35 tonnes
 Mill cane requirement at 750 TCD = 280 days' x 750 TCD = 210,000 tonnes

Cane supply surplus = (536,824.35– 210,000) = 326,824 tonnes

We project a cane supply surplus of 326,824 tonnes by June 2023.

We recommend timely strategies be put in place to manage the projected cane supply glut to avert challenges associated with cane oversupply.

15.6. Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Cane poaching	Farmer's education/Advance on standing cane.	Advance to be given by both miller and government financial institution.i.e AFC.
Private cane	Private cane to be registered at the age of 0-3months	All companies to ban late registration for it disorients harvesting programs and encourages brokers and cane poaching some farmers evading company investment.
Poor road network	County governments and millers to assist in maintaining roads	The millers and counties to come up with joint programs for roads rehabilitation and maintenance.
Farmer negligence	Capacity building of farmers on GAPs.	More technical advice to be given to the farmers at the period of 0-8 months, this is a stage where the crop requires close attention. To enhance extension services to farmers To enhance technical capacities of the County agriculture staff Establishment of demo plots to show case GAPs
High cost of Inputs	Government to subsidize	Farmers to be sensitized on the use of organic fertilizer and single eye bud chip technology.
Cane Brokers	Government to create policy to govern brokers	Sugar general regulations to be reinforced

Un predictable weather condition (climate change)	Adopt early maturing varieties. (To adopt and implement the National strategy on climate change and mitigation measures	To embrace irrigation in sugarcane farming The Sugar Directorate through Meteorological Department to timely relay information on weather forecasting for proper planning of cane development activities
Arrowing (Flowering)	Use of resistant varieties	Farmers to be sensitized on use of certified seed cane and plant appropriate varieties per region
Human Pest	Local Administration to warn residents through local Barraza's	Management to approach the local administration to enhance restriction of human pest.
Small land fragmentation	Encourage block cane development.	It will be easier to monitor and provide services.

16.0. BUSIA SUGAR INDUSTRY LTD

16.1. Area under cane

16.1.1. Area under cane by Counties

Table 70: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)	% AREA COVERAGE
BUSIA	MATAYOS	1,928	88	2,016	4,031	0.50	18.23
	NAMBALE	3,318		3,318	5,531	0.60	30
	TESO NORTH	664		664	1,106	0.60	5.91
	TESO SOUTH	2,514	30	2,544	4,240	0.60	23
	BUTULA	221		221	553	0.40	2
	FUNYULA	88		88	177	0.50	0.80
	SUB-TOTAL	8,733	118	8,851	15,638	0.57	80.0
KAKAMEGA	MUMIAS WEST	219		219	168	1.30	1.98
	MATUNGU	278		278	555	0.50	2.51
	SUB-TOTAL	497	-	497	723	0.69	4.49
BUNGOMA	BUMULA	1,327		1,327	2,655	0.50	12
	BUNGOMA SOUTH	275		275	689	0.40	2.52
	SUB-TOTAL	1,602	-	1,602	3,344	0.48	14.52
SIAYA	UGENYA	111		111	138	0.80	1
	SUB-TOTAL	111		111	138	0.80	1
TOTAL		10,943	118	11,061	19,843	0.56	100

The raw material catchment for Busia Sugar Industry Limited (BSIL) was in the Counties of Busia (80%), Bungoma (15%), Kakamega (4%) and Siaya (1%).

16.1.2. Area under cane by sector and yields

Table 71: Area under cane by sector and yields

	AREA UNDER CANE (HA)		CANE YIELD (TCH)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	10,943	13,675.8		68.85
NUCLEUS	118	75.6		46.32
TOTAL	11,061	13,751.4	69.60	46.32

The area under cane declined by 20% mainly in the Out growers to 11,061 Ha from 13,751 Ha reported in December 2020. This is attributed to high ratoons recruited from former Mumias which has since gone out of cycle.

We project an increase in yield from 46.32 Tc/Ha realized in 2020 to 69.60 Tc/Ha in 2021. The big improvement in projected yield could be attributed to good rains received in 2021 and anticipated appreciation in harvesting age.

16.2. Area under cane by crop classes

Table 72: Area under cane by crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	3,001	50	3,051	27.58
R1	3,598	37	3,635	32.86
R2	2,953	31	2,984	26.98
R3+	1,391	-	1,391	12.58
TOTAL	10,943	118	11,061	100

The crop cycles PC: R1:R2: R3+ ratios was 28:33:27:12 against the industry standard of 30:30:30:10 for stable cane supply.

We **recommend enhanced** cane planting over time to increase cane area commensurate with a 3,000 TCD factory. This will also restore the crop cycles ratios to the desired industry standard.

16.3. Area under cane by varieties

Table 73: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	95	1	96	0.87
CO 945	10,532	38	10,570	95.56
D 84 84	82	-	82	0.74
KEN 83-737	161	31	192	1.74
EAK 73 335	5	-	5	0.05
FR 95 2345	42	44	86	0.78
Mixed	26	4	30	0.27
TOTAL	10,943	118	11,061	100

The popular variety was Co 945 at 96% coverage of the cane area followed by KEN 83-737 (2%) and others 2%.

The cane varieties were not well distributed as is captured above. This is risky in case of a disease outbreak attacking the CO945 variety.

16.4. Area under cane by crop ages

Table 74: Area under cane by ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	4,602	91	4,693	42.43
7 -12	3,414	27	3,441	31.11
13-18	2,808	-	2,808	25.39
19+	119	-	119	1.08
TOTAL	10,943	118	11,061	100

From the table above, the surface area for 0-12 months old cane occupies 75%. This is an indication that more of the cane will be available in the next financial year 2022/2023.

16.5. Cane availability Projections

16.5.1. Cane Projection -Dec 2021- June 2022

Cane age available = 13 months and above

Area under cane available = 2,927 Ha

Cane available = 2,927 Ha x 69.60 Tc/Ha = 203,719 tonnes

Mill requirement at 3,000 TCD = 164 days' x 2,500 TCD = 410,000 tonnes
Cane supply Deficit = (203,719 – 410,000) Tc = **(206,281) tonnes**

We project a cane supply deficit of 288,281 tonnes by June 2021.

16.5.2. Cane Projection - 2021/2022

Cane age available = (0 -12) + (PC+R1+R2) 19+ months

Area under cane available = 8,253 Ha

Cane available = (8,253 Ha x 69.60 Tc/Ha) – 206,281 Tc
= 368,128 Tonnes

Mill requirement at 3,000TCD = 280 days' x 2,500TCD = 700,000 tonnes

Cane supply deficit = 368,128 – 700,000 = **(331,872) tonnes**

We project a cane supply deficit of 331,872 tonnes by June 2023.

BSIL will generally experience a severe cane supply deficit during the period under review. We **recommend** enhanced cane planting and yield enhancement initiatives in the zone. This will also increase area under cane to desired levels for a 3,000 TCD factory for a sustainable cane supply.

16.6. Cane production constraints in the zone & possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Termite infestation	Use of insecticides i.e. Confidor	
Harvesting problems in lowlands during wet seasons	Harvesting programme only during dry periods i.e. January, February, July and December	
Flooding along river Suo during heavy rains	Building dykes along the river Redevelopment of damaged cane	
Poor infertile sandy soil	Use of Filter Press mud (FPM) and inorganic fertilizer	

17.0. CHEMELIL SUGAR COMPANY

17.1. Area under Cane

17.1.1. Area under cane by Counties

Table 75: Area under cane by Counties

NAME OF THE COUNTY	NAME OF THE SUB-COUNTY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL HECTARES	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)	% AREA COVERED
KISUMU	MUHORONI	8567.92	1729.4	10,297.30	6,748	1.52	57.00
	NYANDO	833.8		833.8	1,371	0.6	4.60
	SUB-TOTAL	9,401.70	1,729.40	11,131.10	8,119	1.16	61.65
NANDI	TINDERET	6925.60		6,925.60	3,790	1.83	38.35
	SUB-TOTAL	6925.60		6,925.60	3,790	1.83	38.35
TOTAL		16,327.30	1,729.40	18,056.70	11,909	1.5	100

The area under cane was spread in the Counties of Kisumu (63%) and Nandi (37%).

17.1.2. Area under cane by sector and yields

Table 76: Area under Cane by sector and Yields

	AREA UNDER CANE (HA)		CANE YIELD (TCH)	
	Dec-21	Dec-20	Dec-21	Dec-20
OUTGROWERS	16,327.30	16,088	64.37	48.05
NUCLEUS	1,729.40	1,423	55.06	39.12
TOTAL	18,056.70	17,511	62.61	46.65

The area under cane increased by 3% from 17,511 Ha in December 2020 to 18,056.70 Ha reported in December 2021. The increase in area under cane could be attributed to cane development activities in the Out growers.

The yield increased from 46.65 Tc/Ha recorded in December 2020 to 62.61 Tc/Ha in December 2021. The increase may be attributed to enhanced cane nutrition initiatives in the zone.

17.2. Area under cane by Crop Classes

Table 77: Area under cane by Crop classes

CROP CYCLE	OUTGROWER (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
PC	2,199.80	584.40	2,784.20	15.42
R1	2,605.00	232.40	2,837.40	15.71
R2	2,204.70	201.80	2,406.50	13.33
R3+	9,317.80	710.80	10,028.60	55.54
TOTAL	16,327.30	1,729.40	18,056.70	100

The crop cycles PC: R1:R2: R3+ ratio was 15:16:13:56 compared with the industry standard of 30:30:30:10 for stable cane supply. The low proportion of plant crops and very high ratoon crop proportion was indicative of low cane development activities in the zone over time.

We **recommend** structured intensive cane planting to be initiated and sustained in the zone to normalize the crop cycles proportions for enhanced cane supply to the factory.

17.3. Area under cane by varieties

Table 78: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 421	321.70	17.70	339.40	1.88
CO 945	16.80	31.90	48.70	0.27
CO 617	15,066.20	315.60	15,381.80	85.19
CO 1148	85.60	4.50	90.10	0.50
D 84 84	35.20	10.00	45.20	0.25
CB 38/22	596.77	1,162.80	1,759.57	9.74
N 14	0.00	9.70	9.70	0.05
KEN 83-737	132.30	44.80	177.10	0.98
CO 331	28.03	0.00	28.03	0.16
EAK 70 76	10.10	0.00	10.10	0.06

EAK 90 97	0.00	36.40	36.40	0.20
KEN 82 808	27.40	0.00	27.40	0.15
KEN 82 472	7.20	0.00	7.20	0.04
KEN 98 533	0.00	2.00	2.00	0.01
Others	0.00	47.20	47.20	0.26
Mixed	0.00	46.80	46.80	0.26
TOTAL	16,327.30	1,729.40	18,056.70	100

The popular cultivated variety was CO 617 with a proportion coverage of (85%), followed by CB 38 22 (10%), CO 421 (2%), KEN 83 737 (1%) and others.

The varieties pool is rich, however, we recommend efforts to increase area under improved varieties.

17.4. Cane distribution by Crop ages

Table 79: Area under cane by crop ages

AGE (MONTHS)	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
0 - 6	4,481.26	676.60	5,157.86	28.56
7 -12	4,411.43	712.20	5,123.63	28.38
13-18	5,068.76	340.60	5,409.36	29.96
19+	2,365.85	0.00	2,365.85	13.10
TOTAL	16,327.30	1,729.40	18,056.70	100

The proportion of cane under the age of 0 – 12 months is 57% and will be available during 2021/2022 season.

17.5. Cane availability Projections

17.5.1. Cane projection - December 2021 -June 2022

Cane age available	= 13 months and above
Area under cane available	= 7,775 Ha
Cane available	= 7,775 Ha x 62.61 Tc/Ha = 486,844.57 tonnes.
Mill requirement at 3,000 TCD	= 164 days x 3,000 TCD = 492,000 tonnes
Cane supply deficit	= 486,844.57 – 492,000 = (5,155) tonnes

We project a cane supply deficit of 5,155 tonnes by June 2022.

17.5.2. Cane projection - 2022/2023

Cane age available	= (0 -12) + (PC+R1+R2)19+ months
--------------------	----------------------------------

Area under cane available	= 12,668 Ha	
Cane available	= (12,668 Ha x 62.61 Tc/Ha +5,155) Tc	
	= 719,602.88 tonnes.	
Cane requirement at 3,000 TCD tonnes	= 280 days x 3,000 TCD	= 840,000
Cane supply deficit tonnes	= (719,602.88 – 840,000) Tc	= (120,397)

We project a cane supply deficit of 120,397 tonnes by June 2023.

We **recommend**:

- i) Initiate rigorous cane development activities in the zone to increase on cane area and the proportion of plant crops for a stable cane supply; and

17.6. Cane production constraints in the zone & possible mitigation

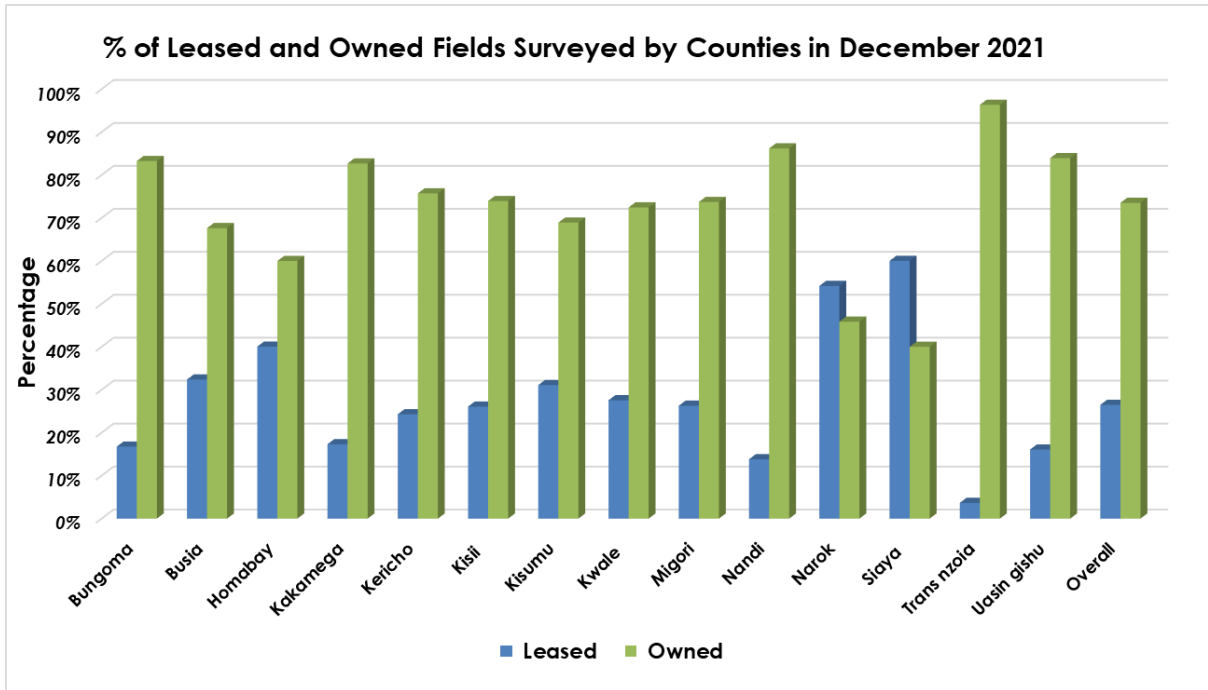
CONSTRAINT	MITIGATION	REMARKS
Lack of reliable and affordable source of funds for cane development	Re-introduction of Sugar Development Fund	
Shrinking average farm sizes	Blocking operations by providing funds for contract farming	
Poor distribution channels for farm inputs	Millers to stock subsidized farm inputs	
Over reliance on rain fed agriculture	Promoting irrigated cane farming	
High cost of farm inputs	Introducing subsidies for sugarcane farm inputs	
Lack of certified seed cane/ low adoption of new varieties	Introducing a seed cane production protocol	

APPENDICES

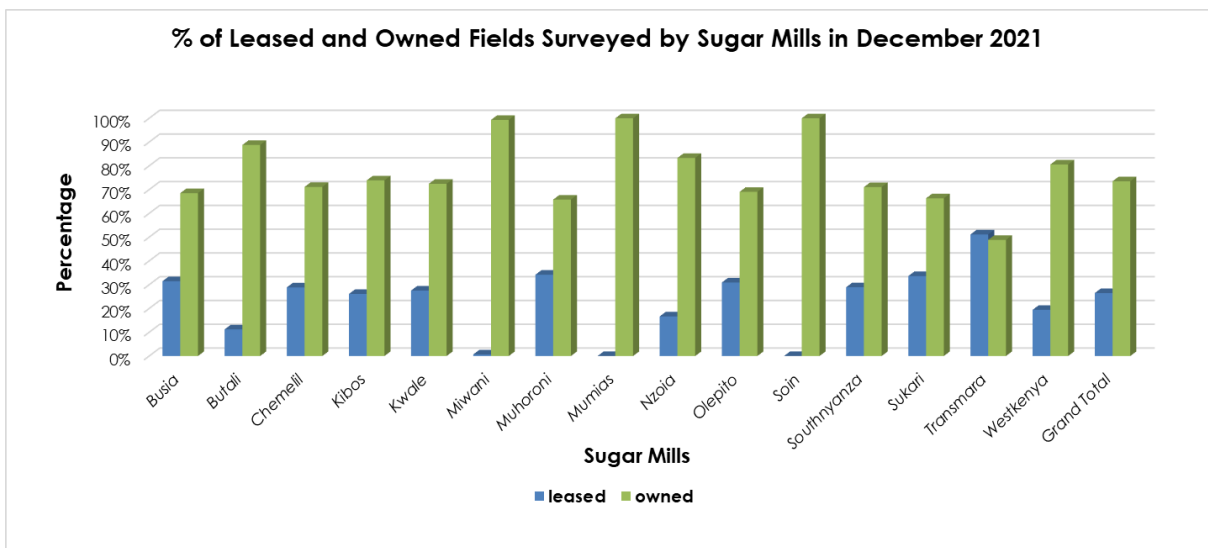
Appendix 1: Survey Finding 1: Age Group Distribution by Sugar Company 2021

Survey Findings: Age Group Distribution by Sugar Company						
Sugar Company	Age Group					Grand Total
	20-30	31-40	41-50	51-60	Above 60	
Busia	8%	23%	27%	31%	11%	100%
Butali	3%	21%	34%	27%	15%	100%
Chemelil	1%	16%	36%	25%	22%	100%
Kibos	2%	23%	37%	28%	11%	100%
Kwale	0%	3%	16%	43%	38%	100%
Miwani	0%	0%	0%	0%	0%	0%
Muhoroni	2%	19%	32%	29%	18%	100%
Mumias	0%	0%	0%	0%	0%	0%
Nzoia	1%	19%	32%	25%	22%	100%
Olepito	1%	12%	50%	26%	11%	100%
Soin	19%	51%	18%	11%	2%	100%
South Nyanza	3%	20%	37%	28%	12%	100%
Sukari	5%	32%	32%	22%	9%	100%
Transmara	2%	19%	40%	29%	10%	100%
West kenya	3%	17%	33%	28%	20%	100%
Grand Total	3%	21%	35%	27%	15%	100%

Appendix 2: Survey Finding 2: % of Leased and Owned Fields Surveyed County wise in December 2021



Appendix 3: Survey Finding 3: % of Leased and Owned Fields Surveyed by Sugar Mills in December 2021



Appendix 4: AFA Staff

1. FREDERICK KEBENEY
2. RICHARD MAGERO
3. BEATRICE ODIWA
4. STANLEY BABIKHA
5. KENNEDY NYONGESA
6. JOSEPH OCHOLLAH
7. STANLEY KOECH
8. ELISHA MTOGO
9. SHADRACK KIPRONO
10. PATRICIA NJERU
11. AGNES MWANGI
12. DANIEL ONYANGO
13. PAUL SONGA
14. STEPHEN WANJALA
15. NANCY ATIENO
16. JAMES NJUE
17. JOHN KYULE
18. ALVIN MWANGI
19. BASIR MUSA
20. BARBARA MAENDE
21. NORAH GETENGA

Appendix 5: Enumerators and Mill Staff

1. KIBOS

ENUMERATORS

DANCAN OMONDI
PATRICK KIPROTICH
ALEX KIBET BII
PHILEMON KIPTOO KERAWA
ENOCK OYOO NGESO

MILL STAFF

JORAM NYABUTE
JULIUS MARITIM
ERIC WAZAKI
SIMEON BIWOT
FRED OPATA

2. CHEMELIL

ELIZABETH AOKO ONJIRA
WILSON OTIENO OGWANG'
FREDRICK OKEYO OKEYO
PHILIP KIMELI TARUS
EMMANUEL KIPSANG TUM
KENNEDY KIPRONO LIMO
ISAACK CHERUIYOT NG'ETICH
BELINDA AKOTH MAGERO
ELVIS OLUOCH AGUTU
DANIEL OKORE OKINDA

JOYCE NAIVASHA
FREDRICK ONJIRA
COLLINS OMBURA
GEORGE ODENY
GEORGE O. OWITI
NELSON OKUKU
PHILEMON TOO
JACOB CHEPKWONY
ALLAN KIPLAGAT
KENNEDY BIRGEN
RUTH JEPKOECH
ABISALOM OTIATO
FLORENCE ODONDI
RAPHAEL YOGO

3. MUHORONI

GERALD OGINGA
GEORGE MBUDI
RICHARD KITUR
RAILA FREDRICK
NGETICH CHARLES
SYLVIA OLERO
WELDON K LANGAT
BENARD K KOECH
OPAR ERUSTUS KOTH
QUINTER ANYANGO

SYLVESTER ODHIAMBO
DANIEL OTIENO
EMMANUEL OCHIENG
BENARD K MUTAI
JOSEPH MATINGWONY
DAN OPIYO
JOHN ODARI
JOHN KIPRONO MUNAI
CHARLES WAMBOGA
KENNEDY ODENY
LEONARD APIYO

4. MIWANI

ROSEMARY ANGUGO
TERESIAH AKOTH

FRED BOGE (COORDINATOR)
AMOS OLIECH
DICKSON OCHIENG

5. SOIN

GIDEON K YEGON
BII K. WELDON

DANIEL K. RUGUT
MESHAK K. KORIR
JAMES BETT (COORDINATOR)

6. SONYUGAR

MICHAEL OSANO
KEVIN OKWIRI
WINNIE OTIENO
AKAHALA EVONNE
REGAN OTIENO
KEVIN OKWIRI
SABBATH MAKINDI
BONIFACE ODHIAMBO

BENARD ODIRA
BENARD ANYANGO
GEOFFREY OKOTH
JOHN ODINYA
EBEL ODHIAMBO
CANCAUS OTIENO
REUBEN OMEGA
DAVID AWOUR (COORDINATOR)

7. SUKARI

PETER ABONGO
DOMENICO ACHIENG
JOHN OCHOLA
DOMNIC OCHAYO
DANIEL MBITI
DENISH OMWANDO
ELECTINE JANE
PAUL OKUKU
MARCEL OTIENO
WINNIE AWUOR

VICTOR OSWAGO
SILVANS KASILAS
KENNEDY OTIENO
EUSTO ODERO
DENISH ODHIAMBO
MARK OYUGI
JOHN OKETCH
DAN ODERO
JOHN EVANCE
JABEZ OWITI
JAPHETH KIPUKEL

8. TRANSMARA

TONY LEKOKEI
MEKURO MICHAEL
JOSHUA KONONGOI
CAROLINE NAIRENKE
DAVID SAOYO
DANIEL LESHAO
TORKOSH LEPITA
JUSTUS AYIEGA
ALFRED OJJI
EZEKIEL ATEMBA

MAISIA LETOO
NAIRENKE CALEB
JULIUS SAIYUAH
DANIEL KAKA
HESBON NYANGENCHO
LUCY ACHIENG
CHARLES OYARO
OLUKWO MAURICE

9. BUSIA SUGAR INDUSTRY

SAIDA OMOTO MUNGAYI
SAMUEL BARASA MASAKA
DAVID ALUKU
SULEIMAN MUCHELULE ABDALLAH
JOB SISUMA ANDATI
WALTER BATH JAOKO ADEYA
MARTIN WAFULA NDAKWA
CHARLES OTIENO OUMA
LORNA OLIVE OKACHA

VINCENT MAKELLO
SAMUEL KATAM
SETH AYOTI
HERBART E.OMARE
KALIVO SHINOSI
SYLVIA M. NYONGESA
ALBERT WANDERA
TITUS KHALWALE
DISMUS MASINDE
AMBROSE ABUNGU

10. OLEPITO

PERES OMWISAMI ALINDAH
JOHN WESONGA AKULLU
LINDALYN ITINOT
PETER WALIMOLI SIKUKU
REBECCA MASINDE
CELESTINE NAFULA KILALI
JULIAS MUSUNDI OMETTY

DEOGRACIOUS ONGALA EMOIT
JAMES MWANGANGA
ISAIAH OMBUNDA MUTSOTSO
AMBROSE BONSTONE BARASA
IGNATIUS KEMBU OTIELI
GEOFFREY EKEYA
DAVID ODHIAMBO ODERO

11. NZOIA

VELLA NASIKE MWASAME
METRINE N. MUNYOLE
SAUL WANJALA
DENNIS WEKESA WANYONYI
JOHN WABUKE
PAUL WANJALA WEKESA
ABSOLOM WAMBULWA
EZEKIEL W.MARUTI
ELIZABETH A. OCHOLIA

JOAB OMULUBI (COORD)
ABEL NAMIANYA
GODFREY A. WANYONYI
CEPHAS WABWILE
CHARLES SIMIYU
SUSSY BUYAYI
PETER WAFULA MAKHANU
TITUS K.KUNDU
JANET JUMA
BRENDA N. WAFULA

12. KWALE

MOHAMED MWAZITO

WYCLIFFE KOMBA

RAMLA SALIM
MWANAMISI BAKARI
ESTHER MMBONE

VICTOR OMALA
GODFREY MUKANZI
EDWIN KOECH
TARIKU GEBEYEHU (Co-ordinator)

13. BUTALI

TIMOTHY OKINDA NDUKU
DEBORAH N WALUMOLI
SAMMY SIMIYU CHIKAMAI
KEFA W. WANANGWE
NOAH KIPCHIRCHIR KAPTINGE'I
PATRICK WANYAMA MUKONGOLO
MILLICANT TUWEI
IAN KIPKIRUI
ANN K. CHIKAMAI
ADELINE N. NYONGESA

SIMON KALERWA
CHRISTOPHER SINDAVI
FRANCIS NYINZA
NICHOLAS TUKERO
N THILAHAR
ALLAN EGABA
PHILIP ODHIAMBO
PETER ROTICH
MICHAEL O. NAMUNYU
ATANUS SAMOEI
KARTHIK RAJ (COORDINATOR)

14. WEST KENYA

ABEL O OWINYI
KEVIN A. LIKUYI
ZAINAB OKUMU
FRANKLIN MUTALI
AYUB W. MUNYASIA
LAWRENCE NAMBAMI
PERIS NANJILA PHILIP
SHILLAH AWINO ETALE
COSMAS MUUDY
GABRIEL VIKETO
JOSPHAT KIPKOSGEI BIWOT
FELIX MUNANGA
CELESTINE MUKAMANI
KELVIN S. KUNDU
CHRISTINE K. ALFAYO
GLADYS E. MWANFE
JUSTUS MARUTI
JANE LUMBASI

ERICK B. JOTHAM
ABSOLOM SOITA
GILBERT K. BAKER
HUMPHREY S. CHIKAMAI
BENSON N MUKOYA
MAURICE M. OCHWAYA
LEVI M. MAMULI
HEZRON W. SHINOSI
WASHINGTON WAWIRE NGAO
LEVY C. CHENENJE
JOEL K. APUYA
MICHAEL O AMEDA
AGGREY MUCHESIA
BONIFACE KIBIWOT
TABITHA CHEROP
MICHAEL SIKINGA
ISAAC JUMA
JAMES IKAPEL
ERIC BUKWEYE (COORDINATOR)

15. MUMIAS

JARED BUNGE

ABRAHAM SHITSIMI
KENNEDY WASIKE (COORDINATOR)

END

