SUGAR DIRECTORATE

Cane Availability Survey Report 2020/2021 – 2021/2022

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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 2020 Industry cane availability survey was undertaken from 7th to 17th December 2020 to establish the cane situation and make projections of its availability for processing into sugar. This was done by 5 field enumeration teams who carried out visual physical assessment of cane to estimate the expected yields. 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 of flow of data between enumerators and the office, error tracking, actual location using GPS etc.

The resultant report is used in planning and in providing advisory services to stakeholders.

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)		
	20-Dec	19-Dec		2020*	2019	% Variance
CHEMELIL	17,511	16,985	3.1	55.88	36.27	54.07
MUHORONI	13,666	13,579	0.64	63.19	38.98	62.11
MUMIAS	198	1,925	- 89.71	67.98	N/A	N/A
NZOIA	18,684	18,146	2.91	61.26	43.96	39.35
SOUTH NYANZA	9,197	10,674	-13.84	63.53	65.64	-3.21
KIBOS	7,379	8,013	-7.91	74.84	63.48	17.9
SOIN	1,921	1,873	2.56	67.67	N/A	-
BUTALI	19,959	14,761	35.21	78.23	61.83	26.52
WEST KENYA	48,969	46,485	5.34	76.54	45.89	66.8
MIWANI	1,910	1,938	-1.44	34.49	26.55	29.91
SUKARI	17,732	14,721	20.45	67.76	48.89	38.6
TRANSMARA	15,791	14,455	9.24	88.22	95.47	-7.59
KWALE	6,763	9,488	- 28.72	80.63	59.18	36.24
OLEPITO	9,186	8,784	4.58	60.98	37.83	61.19
BUSIA	13,751	14,979	- 8.2	61.62	37.27	65.33
TOATAL	**202,616**	**196,806**	**2.95**	**67.00**	**51.26**	**30.71**

projected

The area under cane increased by 2.95% to 202,616 Ha from 196,806 Ha reported in December 2019. This was majorly due to expansion of cane area in the Butali Sugar Mills, Sukari Industries and Transmara catchments.

Industry mean productivity was projected at 67 Tc/Ha, an increase by 30.71% compared with the actual yield of 51.26 Tc/Ha realized in 2019. The improvement in productivity could be attributed to good rains received in 2020, expected appreciation in harvesting age as well as improved cane development activities by some mills.

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

COUNTY	AREA UNDER CANE (Ha)			NO. OF GROWERS	AVERAGE CANE PLOT SIZE (Ha)
	OUTGROWERS	NUCLEUS ESTATE	TOTAL	-	-
BUNGOMA	36,329	2,765	39,094	69,378	0.52
KAKAMEGA	37,399	198	37,597	66,421	0.56
KISUMU	23,455	4,539	27,993	19,097	1.23
MIGORI	17,428	2,290	19,718	22,757	0.77
BUSIA	17,876	87	17,963	26,802	0.67
NAROK	15,396	39	15,435	17,017	0.90
NANDI	14,628	62	14,690	11,161	1.31
KERICHO	7,344	176	7,521	8,963	0.82
KWALE	3,263	3,501	6,763	246	13.26
HOMABAY	6,453	0	6,453	8,042	0.80
TRANSNZOIA	4,653	0	4,653	555	8.38
UASIN GISHU	3,072	0	3,072	1,323	2.32
KISII	1,114	0	1,114	2,203	0.51
SIAYA	549	0	549	457	1.20
TOTAL	**188,960**	**13,656**	**202,616**	**254,422**	**0.74**
% COVERAGE	**93**	**7**	**100**	**-**	**-**

The 202,616 Ha cane area was spread in 14 Counties in the following proportions – Bungoma 19.3%, Kakamega 18.6%, Kisumu 13.8%, Migori 9.7%, Busia 8.9%, Narok 7.6%, Nandi 7.3%, Kericho 3.7%, Kwale 3.3%, Homabay 3.2%, Transnzoia 2.3%, Uasin Gishu 1.5%, Kisii 0.5% and Siaya 0.3%.

The 7% of the surface was in the factory Nucleus Estates and 93% in the Outgrower cultivated by 254,422 farmers.

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

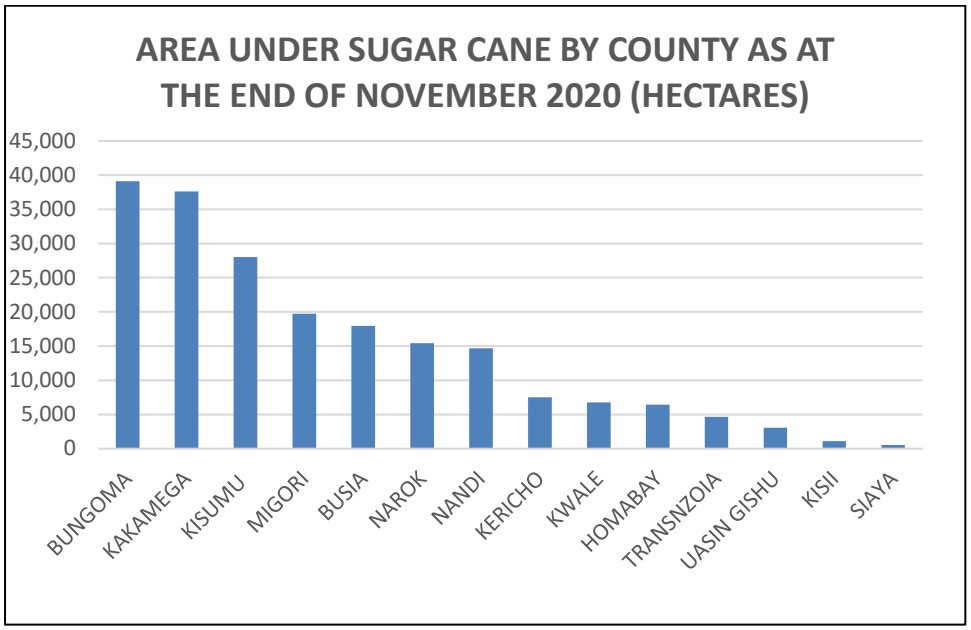
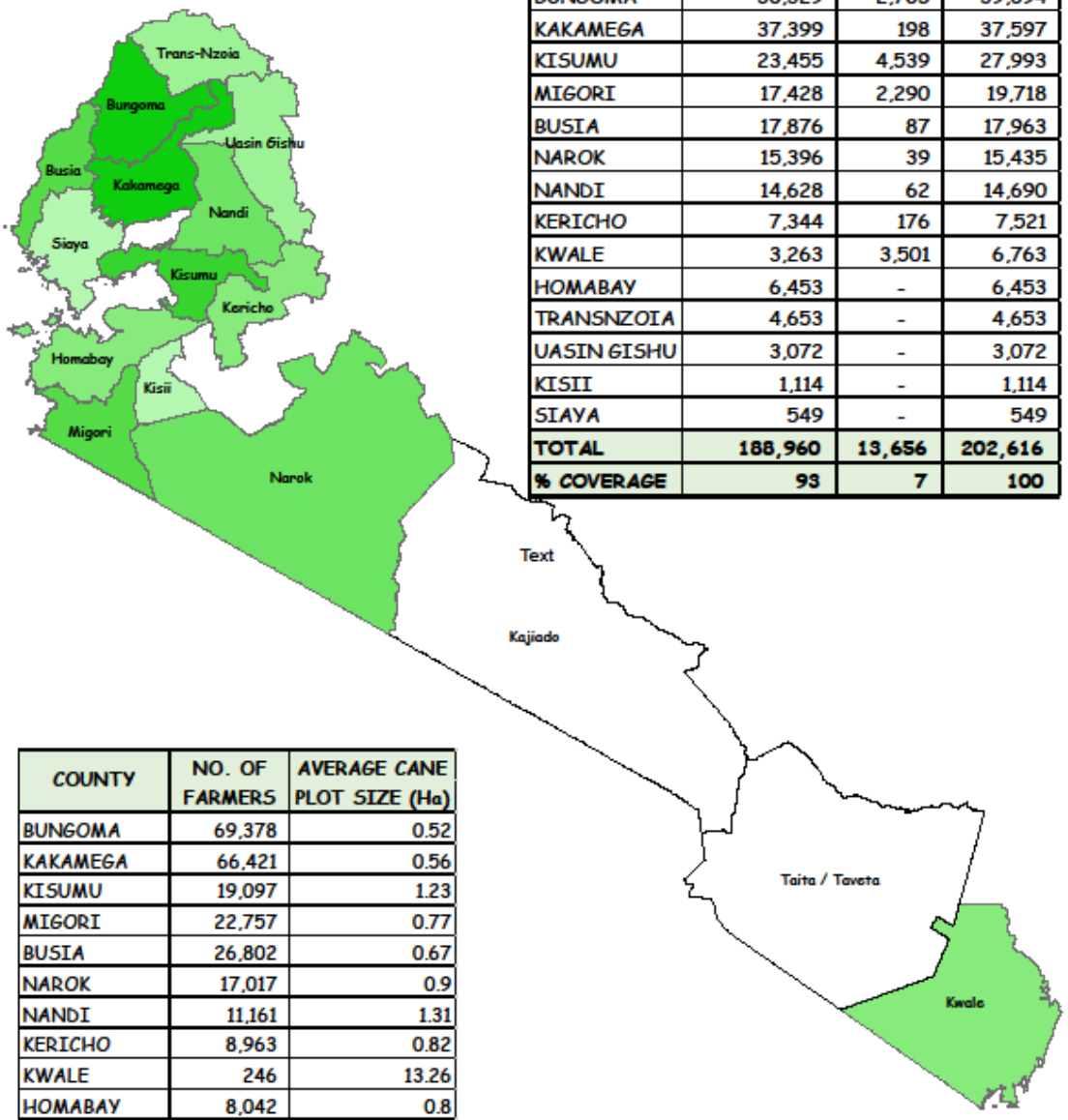


Figure 2: Sugarcane growing Counties, area under cane and number of growers

Area Under Cane as at November 2020

COUNTY	AREA UNDER CANE (Ha)		
	OUTGROWERS	NUCLEUS	TOTAL
BUNGOMA	36,329	2,765	39,094
KAKAMEGA	37,399	198	37,597
KISUMU	23,455	4,539	27,993
MIGORI	17,428	2,290	19,718
BUSIA	17,876	87	17,963
NAROK	15,396	39	15,435
NANDI	14,628	62	14,690
KERICHO	7,344	176	7,521
KWALE	3,263	3,501	6,763
HOMABAY	6,453	-	6,453
TRANSNZOIA	4,653	-	4,653
UASIN GISHU	3,072	-	3,072
KISII	1,114	-	1,114
SIAYA	549	-	549
TOTAL	**188,960**	**13,656**	**202,616**
% COVERAGE	**93**	**7**	**100**



COUNTY	NO. OF FARMERS	AVERAGE CANE PLOT SIZE (Ha)
BUNGOMA	69,378	0.52
KAKAMEGA	66,421	0.56
KISUMU	19,097	1.23
MIGORI	22,757	0.77
BUSIA	26,802	0.67
NAROK	17,017	0.9
NANDI	11,161	1.31
KERICHO	8,963	0.82
KWALE	246	13.26
HOMABAY	8,042	0.8
TRANSNZOIA	555	8.38
UASIN GISHU	1,323	2.32
KISII	2,203	0.51
SIAYA	457	1.2
TOTAL	254,422	0.74
% 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	64,807	2,617	67,425	33
R1	56,458	2,439	58,897	29
R2	36,474	2,233	38,707	19
R3+	31,077	6,511	37,588	19
TOTAL	**188,816**	**13,800**	**202,616**	**100**

The PC:R1:R2:R3+ crop cycles ratios in the industry was 33:29:19:19 in December 2020 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	73,016.92	1,783.94	74,800.86	36.92
2	CO 945	59,937.62	2,763.78	62,701.40	30.95
3	CO 617	30,336.35	1,896.21	32,232.56	15.91
4	CO 1148	86.6	31.15	117.75	0.06
5	CO 331	30.25	0	30.25	0.01
6	CB 38 22	1,639.73	1,900.65	3,540.38	1.75
7	D 84 84	5,120.69	579.84	5,700.53	2.81
8	EAK 70 76	21	0	21.00	0.01
9	EAK 70 97	160.38	225.55	385.93	0.19
10	EAK 73 335	5	181.182	186.18	0.09
11	KEN 82 062	1.18	14.61	15.79	0.01
12	KEN 82 121	0	7.93	7.93	0.00
13	KEN 82 216	11.29	3.26	14.55	0.01
14	KEN 82 472	766.93	62.08	829.01	0.41
15	KEN 82 601	0	45.79	45.79	0.02
16	KEN 82 808	699.84	1,229.39	1,929.23	0.95
17	KEN 82 493	6	0	6.00	0.00
18	KEN 83 737	2,273.06	1,388.11	3,661.17	1.81
19	KEN 98 533	4.59	2.83	7.42	0.00
20	KEN 00 3811	0	4.33	4.33	0.00

21	N 14	5,365.11	740.99	6,106.10	3.01
22	FR 95 2345	42.3	37.252	79.55	0.04
23	MS 98 21	0	140.39	140.39	0.07
24	MS 2001 1100	0	7.38	7.38	0.00
25	MS 2005 866	0	20.38	20.38	0.01
26	MIXED	130.43	566.67	697.10	0.34
27	OTHERS	9,161.18	166.24	9,327.42	4.60
	TOTAL	**188,816.45**	**13,799.93**	**202,616.38**	**100**

The 3 dominant varieties were Co 421 (37%), Co 945 (31%) and Co 617 (16%). The balance 16% was occupied by 21 other varieties. The local improved varieties still occupied an estimated 11% of the Industry cane area.

The variety Co 421 was prevalent in the western cane growing zone, Co 617 in Nyando and Co 945 in South Nyanza and Busia.

Mixed varieties was still a challenge to the Industry and occupied 697.10 Ha during the survey. We recommend adoption of seed cane production programme to manage the problem.

1.2.4. Cane Availability Projection

Table 4: Cane availability

FACTORY	DEC 2020 - JUN 2021			JUL 2021 - JUN 2022		
	MILL CANE REQUIREMENT (TONNES)	**AVAILABLE CANE (Tc)**	**SURPLUS (Tc)**	**MILL CANE REQUIREMENT (TONNES)**	**AVAILABLE CANE (Tc)**	**SURPLUS (Tc)**
CHEMELIL	492,000	333,626.24	(158,374)	840,000	544,226.98	(295,773)
MUHORONI	360,800	293,150.44	(67,650)	616,000	574,816.07	(41,184)
MUMIAS (NE)	-	-	-	-	13,460.00	13,460
NZOIA	492,000	169,680.37	(322,320)	840,000	703,815.04	(136,185)
SOUTH NYANZA	492,000	380,115.78	(111,884)	840,000	309,472.52	(530,527)
WEST KENYA	820,000	773,621.81	(46,378)	1,400,000	2,495,689.34	1,095,689
SOIN	-	14,886.41	-	-	120,390.50	-
KIBOS	492,000	219,994.89	(272,005)	840,000	92,736.80	(747,263)
BUTALI	410,000	551,178.56	141,179	700,000	980,015.29	280,015
SUKARI	459,200	583,483.31	124,283	784,000	894,186.26	110,186
TRANSMARA	656,000	850,617.24	194,617	1,120,000	1,154,274.40	34,274
MIWANI (NE)	-	47,068.72	-	-	32,098.53	-
KWALE	396,000	396,734.04	734	801,000	545,297.06	(255,703)

OLEPITO	205,000	301,596.28	96,596	350,000	448,438.27	98,438
BUSIA	492,000	173,662.27	(318,338)	840,000	367,740.37	(472,260)
TOTAL	**5,767,000**	**5,089,416**	**(739,539)**	**9,971,000**	**9,276,657**	**(846,832)**

It is projected, **5,089,416 tonnes** cane will be available for crushing between December 2020 and June 2021 against the Industry mill cane requirement of **5,767,000 tonnes**. This reflects cane deficit of **739,539 tonnes** by end of June 2021. However, this will be **38%** improvement compared with **3,679,655** Tonnes milled for period December 2019 to June 2020.

During 2021/22 season, **9,276,657 tonnes** of cane will be available against the industry cane requirement of **9,971,000 tonnes** resulting to a supply deficit of **846,832 tonnes.** West Kenya, Butali Sugar Mills, Sukari Industries factories will have substantial cane supply surpluses. Transmara and Olepito will experience moderate cane supply surplus, whereas Kibos Sugar and Allied Industries, South Nyanza, Chemelil, 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.

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

Five enumeration teams were constituted and each assigned a cluster of factories as below:

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

During the survey, cane inventory data was provided by millers and 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. The summed scores as a proportion of the possible maximum score (20) multiplied by the respective crop cycle threshold yield gave the estimated crop cycle productivity. The weighted mean of the crop cycles yield values represented the projected productivity for the zone.

The threshold yields of 100, 90, 80 and 70 tonnes per hectare for plant crop, ratoon 1, ratoon 2 and ratoon 3 respectively were adopted for rainfed system during the survey.
The outcome of the exercise will be used in regulating, developing and promoting the sugar industry. The survey findings will be used to project the industry cane availability for budget making, decision-making and advisory purposes to the stakeholders.

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 - Beatrice Odiwa, Stanley Babikha, Jason Mugo, Kennedy Nyongesa, Joseph Ochollah, Team members -Stanley Koech, Oscar Kai, Elisha Mtogo, Shadrack Kiprono, Paul Songa, John Kyule, Alvin Mwangi, 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	1,921	O	1,921	3,000	1.56	100
	SUB-TOTAL	**1,921**	**0**	**1,921**	**3,000**	**1.56**	**100**

The cane supply catchment for Soin sugar Company was 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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUT GROWERS	1,921.00	1,873.00	67.67	N/A
NUCLEUS	0	0	0	0
TOTAL	**1,921.00**	**1,873.00**	**67.67**	**N/A**

The area under cane increased by 2.56% to 1,921 Ha from 1,873 Ha reported in December 2019. This could be due to cane planting by growers owing to the ready market for mill cane by neighboring mills.
The projected zonal yield of 67.67 Tc/Ha was comparable to the industry projected yield of 67 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	828	0	828	43.10
R1	575	0	575	29.93
R2	355	0	355	18.48
R3+	163	0	163	8.49
TOTAL	**1,921**	**0**	**1,921**	**100**

The crop cycles PC:R1:R2:R3+ ratio was 43:30:18:9 against the Industry standard of 30:30:30:10 for stable cane supply. The high ratio of plant to ratoon crops could be attributed to sustained cane planting by farmers in the catchment.

3.3. Area under cane by varieties

Table 8: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 945	661.4	0	661.4	34.43
CO 617	382.32	0	382.32	19.90
CO 421	405.2	0	405.2	21.09
N 14	114.3	0	114.3	5.95
KEN 83 737	225	0	225	11.71
EAK 70-97	39.58	0	39.58	2.06
D 84 84	83	0	83	4.32
CB 38-22	10.2	0	10.2	0.53
TOTAL	**1,921**	**0**	**1,921**	**100.00**

The most popular variety Co 945 occupied 34% followed by Co 421 (21%), Co 617 (20%) and others 25%.

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	984	0	984	51.22
7 -12	717	0	717	37.32
13-18	134	0	134	6.98
19+	86	0	86	4.48
TOTAL	**1,921**	**0**	**1,921**	**100**

The bulk of the crop, 51% was 0 – 6 months and will be available during 2021/2022 season.

3.5. Cane availability projections

3.5.1. Cane projection for Dec 2020 to June 2021

Cane age available = 13 months and above
Area under cane available = 220 Ha
Cane available = 220 Ha x 67.67 Tc/Ha = 14,886.41 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 = 717 Ha + 984 Ha + 78 Ha
Cane available = 1,779 Ha x 67.67Tc/Ha = 120,390.50 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 and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Prolonged closure of factory	To re-open in 2021	Millers are at risk to invest in cane development
Poor roads infrastructure	Reinstate the Sugar Development Fund	To liaise with the County Government
Low uptake of new improved varieties	Avail seed cane of improved varieties	
Inadequate cane development funds	Reinstate Sugar Development Levy	

4.0. BUTALI SUGAR MILLS LTD.

4.1. Area under cane

4.1.1. Area under cane by Counties

Table 10: 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	4,930	0	4,930	12,325	0.40	24.70
	NAVAKHOLO	4,150	0	4,150	4,212	1.00	20.79
	SHINYALU	1,076	0	1,076	1,045	1.00	5.39
	MUMIAS EAST	276	0	276	301	1.00	1.38
	LUGARI	3,157	0	3,157	3,946	0.80	15.82
	LIKUYANI	525	0	525	262	2.00	2.63
	SUB-TOTAL	**14,114**	**0**	**14,114**	**22,091**	**0.64**	**70.71**
BUNGOMA	TONGAREN	785	0	785	412	1.90	3.93
	SUB-TOTAL	**785**	**0**	**785**	**412**	**1.91**	**3.93**
TRANS NZOIA	KIMININI	158	0	158	84	2.00	0.79
	SUB-TOTAL	**158**	**0**	**158**	**84**	**1.88**	**0.79**
UASIN GISHU	TURBO	1,284	**0**	1,284	1,027	1.25	6.43
	SUB-TOTAL	**1,284**	**0**	**1,284**	**1,027**	**1.25**	**6.43**
NANDI	MOSOP	3,593	0	3,593	2,872	1.25	18.00
	CHESUMEI	25	0	25	10	2.50	0.13
	SUB-TOTAL	**3618**	**0**	**3618**	**2,882**	**1.26**	**18.13**
TOTAL		**19,959**	**0**	**19,959**	**26,496**	**0.75**	**100**

The cane supply catchment was in the Counties of Kakamega (71%), Nandi (18%), Uasin Gishu (6%), Bungoma (4%) and Trans Nzoia (1%).

The proportion of cane in Kakamega County increased by 6% from (65%) in 2019 to (71%) in 2020, this could be to attributed to enhanced cane expansion 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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUT GROWERS	19,959.00	14,761	78.23	61.83
NUCLEUS	0	0	0	0
TOTAL	**19,959**	**14,761**	**78.23**	**61.83**

The area under cane increased by 35% to 19,959 Ha from 14,761 Ha reported in December 2019 majorly due to expansion of cane area in Kakamega County. Productivity was projected to improve by 26% to 78.23 Tc/Ha from 61.83 Tc/Ha realized in 2019. The envisaged yield improvement could be due to good rains received in 2020.

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	7,381	0	7,381	36.98
R1	6,065	0	6,065	30.39
R2	4,307	0	4,307	21.58
R3+	2,206	0	2,206	11.05
TOTAL	**19,959**	**0**	**19,959**	**100**

The crop cycles PC:R1:R2:R3+ ratios was 37:30:22:11 against the industry standard of 30:30:30:10 for stable cane supply. The high plant crop proportion was evident of 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	15,954	0	15,954	79.93
CO 945	2,194	0	2,194	10.99
D 84 84	1,015	0	1,015	5.09
N 14	598	0	598	3.00
KEN 83-737	100	0	100	0.50
OTHERS	98	0	98	0.49
TOTAL	**19,959**	**0**	**19,959**	**100**

The popular variety Co 421 occupied 80%, Co 945 -11%, D 84 84 -5%, N 14 3%, KEN 83 737- 0.5% and others 0.5%. Adoption of new improved locally bred varieties was still low in the zone.

Dominance of variety Co 421 at 80% is 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	5,939	0	5,939	29.76
7 -12	5,731	0	5,731	28.71
13-18	7,227	0	7,227	36.21
19+	1,062	0	1,062	5.32
TOTAL	**19,959**	**0**	**19,959**	**100**

A total of 8,062 hectares was aged 13 months and above and will be available during December 2020-June 2021 season.

4.4. Cane availability Projections

4.4.1. Cane Projection - Dec 2020- June 2021

Cane age available = 13 months and above
Area under cane available = 8,289 Ha

Cane available = 8,289 Ha x 78.23 Tc/Ha x 0.85 = 551,181 tonnes
(**Correction factor of 0.15**)
Mill requirement at 2,500 TCD = 164 days' x 2500 TCD = 410,000 tonnes
Cane available surplus = 551,181 Tc – 410,000 Tc = **141,181tonnes**
A cane supply surplus of 141,181 Tonnes was projected by end of June 2021.

4.4.2. Cane projection - 2021/2022

Cane age available = (0 -12) months + (PC + 1R+ 2R)19+ months
Area under cane available = 11,787
Cane available = (12,615 Ha x 78.23 Tc/Ha x 0.85) Tonnes
+ 141,181 Tonnes
= 980,021
Mill requirement at 2500 TCD = 280 days' x 2500 TCD = 700,000 tonnes
Cane supply surplus = (980,021 – 700,000) tonnes
= **280,015 tonnes**

A cane supply surplus of 280,015 tonnes was projected by end of June 2022.
We recommend regional inter mill cane transfer with cane supply deficient neighbouring mills to avert the delayed harvesting associated with the cane supply glut.
(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 and possible mitigation

CONSTRAINT	**MITIGATION**	**REMARKS**
Poaching of cane	Zoning of cane areas	Millers are at risk to invest in cane development
Lack of capital with Farmers	Accessibility to affordable credit	Financial Institutions to create a special purpose vehicle
Lack of proper feeder roads	Cess fund to be utilized properly to maintain roads	
Fire	Insurance to be made available for fire accident	
Less attractive cane price due to poor realization on sale of sugar	Cheap illegal imports to be banned	

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	1,051.56	1,642.56	2,694.12	2,775	0.38	14.42
	WEBUYE EAST	6,142.28	1,122.18	7,264.46	14,719	0.42	38.88
	KIMILILI	378.74	0	378.74	707	0.54	2.03
	TONGARENI	43.85	0	43.85	78	0.56	0.23
	BUMULA	713.56	0	713.56	887	0.80	3.82
	BUNGOMA SOUTH	5,189.08	0	5,189.08	13,873	0.37	27.77
	KABUCHAI	2,232.96	0	2,232.96	5836	0.38	11.95
	SIRISIA	3.11	0	3.11	5	0.62	0.02
	SUB-TOTAL	**15,755.14**	**2,764.74**	**18,519.88**	**38,880**	**0.48**	**99.12**
KAKAMEGA	NAVAKHOLO	163.67	0	163.67	383	0.43	0.88
	SUB-TOTAL	**163.67**	**0**	**163.67**	**383**	0.43	**0.88**
TOTAL		**15,918.81**	**2,764.74**	**18,683.55**	**39,263**	**0.48**	**100**

The raw material catchment for Nzoia sugar was majorly in Bungoma County (99.12%) and a small proportion in Kakamega (0.88%).

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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUT GROWERS	15,918.81	15,358.16	61.26	49.65
NUCLEUS	2,764.74	2,788.14	61.26	36.07
TOTAL	**18,683.55**	**18,146.3**	**61.26**	**43.96**

The area under cane increased by 3% to 18,683 Ha from 18,146 Ha reported in December 2019. This appreciation in cane area was majorly due to cane development activities in the Outgrower sector.

Productivity was projected to improve by 39% to 61.26 Tc/Ha from 43.96 Tc/Ha realized in 2019. Improvement in yields could be twofold, good rains received in 2020 and growers' own efforts.

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	879.7	701.1	1,580.80	8.46
R1	3,919.6	442.9	4,362.50	23.35
R2	3,831.70	557.6	4,389.30	23.49
R3+	7,287.80	1,063.20	8,351.00	44.70
TOTAL	**15,918.81**	**2,764.74**	**18,683.55**	**100**

The crop cycles PC: R1:R2: R3+ ratios was 8:23:23:45 in December 2020 against industry recommended ratios of 30:30:30:10 for sustainable cane supply. The low proportion of plant crops was a reflection of low cane development activities in the zone.

We recommend intensive cane planting in the zone to normalize the plant: ratoon ratios to the industry standard for sustainable cane supply.

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	8,035.9	1.38	8,037.28	43.02
N 14	2,822.32	536.57	3,358.89	17.98
CO 945	4,445.39	816.08	5,261.47	28.16
KEN 83 - 737	300.64	508.64	809.28	4.33
MIXED	17.00	135.39	152.39	0.82
D 84-84	233.82	556.64	790.46	4.23
KEN 82 - 472	1.45	35.59	37.04	0.20
EAK 70-97	62.29	0	62.29	0.33
CO 1148	0	6.3	6.3	0.03

MS 98-21	0	140.39	140.39	0.75
MS 2001-1100	0	7.38	7.38	0.04
MS 2005 - 866	0	20.38	20.38	0.11
TOTAL	**15,918.81**	**2,764.74**	**18,683.55**	**100**

The popular variety Co 421 occupied 43%, Co 945 -28%, N 14 -18%, KEN 83 737 - 4%, D 84 84- 4% and others 3%. Adoption of the locally improved varieties was still low

The cane variety pool had expanded adequately and we recommend it to be sustained.

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	8,673.86	974.26	9,648.12	51.64
7 -12	5,870.49	395.04	6,265.53	33.54
13-18	1,238.56	503.37	1,741.93	9.32
19+	135.9	892.07	1,027.97	5.50
TOTAL	**15,918.81**	**2,764.74**	**18,683.55**	**100**

There were pockets of over mature cane in the Nucleus Estate swamp fields.

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 = 2,770 Ha
Cane available = 2,770 Ha x 61.26Tc/Ha = 169,680.37 tonnes.
Mill requirement at 3,000 TCD = 164 days x 3,000 TCD = 492,000 tonnes
Cane supply deficit = 169,680 - 492,000 = (**322,320) tonnes**

We projected a cane supply deficit of 322,320 Tonnes by June 2021.

5.5.2. Cane Projection - July 2021– June 2022

Cane age available = (0 -12) + (PC + R1+R2) 19+ months
Area under cane available = 16,751 Ha
Cane available = 16,751 Ha x 61.26 Tc/Ha -322,320 Tonnes
= 703,815.04 Tonnes
Mill requirement at 3,000 TCD = 280 days x 3000 TCD = 840,000 tonnes
Cane supply deficit = (703,815.04 - 840,000) = (**136,185)** tonnes

We project a Cane supply deficit of 136,185 tonnes by June 2022.
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
- Yield enhancement initiatives be sustained to enhance mill cane availability.

5.6. Cane production constraints in the zone and possible mitigation

CONSTRAINT		MITIGATION	REMARKS
i)	Lack of fertilizer	Company to procure fertilizer	Inadequate funds
ii)	Inadequate cane development activities	The company to give priority to cane development	Inadequate funds
iii)	Land fragmentation	Block farming with emphasis on productivity	Land policy issues – Ministry of land & County Government
iv)	Competition from other enterprises	Put emphasis on cane productivity to compete with other alternative enterprises	
v)	Competition from other millers	Improve service delivery to growers	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	% COVERAGE
MIGORI	URIRI	1,549.98		1,549.98	2,940	0.53	16.85
	AWENDO	2,140.74	2,290.2	4,430.94	5,920	0.36	48.18
	RONGO	678.94	0	678.94	751	0.90	7.38
	SUNA EAST	340.45	0	340.45	480	0.71	3.70

	KURIA WEST	60.47	0	60.47	43	1.41	0.66
	SUB TOTAL	**4,770.58**	**2,290.2**	**7,060.78**	**10,134**	**0.47**	**76.78**
HOMABAY	RANGWE	149.78	0	149.78	180	0.83	1.63
	NDHIWA	117.56	0	117.56	135	0.87	1.28
	SUBTOTAL	**267.34**	0	**267.34**	**315**	0.85	**2.91**
NAROK	TRANSMARA	1,746.57	0	1,746.57	1,480	1.18	18.99
	SUB TOTAL	**1,746.57**	**0**	**1,746.57**	**1,480**	**1.18**	**18.99**
KISII	SOUTH MUGIRANGO	121.92	0	121.92	243	0.50	1.33
	SUB-TOTAL	**121.92**	**0**	**121.92**	**243**	**0.50**	**1.33**
TOTAL		**6,906.41**	**2,290.2**	**9,196.61**	**12,172**	**0.57**	**100.00**

The raw material catchment for South Nyanza Sugar Company was in the Counties of Migori (77%), Narok (19%), Homabay (3%) 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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUT GROWERS	6,906.41	8,384	63.53	63.65
NUCLEUS	2,290.2	2,290	63.53	67.72
TOTAL	**9,196.61**	**10,674**	**63.53**	**65.64**

The area under cane reduced by 14% to 9,196.61 Ha from 10,674 Ha reported in December 2019. This was mainly due to reduced cane development in the Outgrower sector.

We too project a 3% decline in yield to 63.53 Tc/Ha from 65.64 Tc/Ha realized in 2019.

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	1,314.743	293.27	1,608.013	17.48

R1	3,071.117	381.77	3,452.887	37.55
R2	2,335.75	414.17	2,749.92	29.90
R3+	184.8	1,200.99	1,385.79	15.07
TOTAL	**6,906.41**	**2,290.2**	**9,196.61**	**100**

The crop cycles PC:R1:R2:R3+ ratios was 17**:**38**:**30**:**15 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
CB 38 22	2.27	105.34	107.61	1.17
CO 1148	0	24.85	24.85	0.27
CO 421	280.21	49.87	330.08	3.59
CO 945	6,305.91	1,284.26	7,590.17	82.53
D 84 84	4.6	0	4.6	0.05
CO 617	0	94.55	94.55	1.03
EAK 70 97	48.41	59.19	107.6	1.17
EAK 73 335	0	1.85	1.85	0.02
KEN 00 3811	0	4.33	4.33	0.05
KEN 82 062	1.18	14.61	15.79	0.17
KEN 82 121	0	7.93	7.93	0.09
KEN 82 216	11.29	3.26	14.55	0.16
KEN 82 472	0	16.28	16.28	0.18
KEN 82 601	0	42.29	42.29	0.46
KEN 83 737	102.11	403.38	505.49	5.50
KEN 98 533	0.59	2.83	3.42	0.04
MIXED	64.93	126.17	191.1	2.08

N 14	84.92	49.2	134.12	1.46
TOTAL	**6,906.42**	**2,290.19**	**9,196.61**	**100**

The zonal popular variety Co 945 occupied 83%, others, KEN 83 737 -6%, Co 421 -4%, N 14 -1%, CB 38 22 -1% and others 5%. The variety mix was satisfactory; however, Co 945 be scaled down as proportion of improved local varieties is increased.

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	1,171.75	492.36	1,664.11	18.09
7 -12	1,176.44	373.03	1,549.47	16.85
13-18	1,632.86	507.3	2,140.16	23.27
19+	2,925.35	917.51	3,842.86	41.79
TOTAL	**6,906.41**	**2,290.2**	**9,196.61**	**100**

The proportion of sugarcane at 19+ months was 42% signifying over mature cane in the zone.

6.5. Cane availability Projections

6.5.1. Cane projection - December, 2020 to June 2021

Cane age available	= 13 months and above	
Area under cane available	= 5,983 Ha	
Cane available tonnes.	= 5,983 Ha x 63.53 TCH	=380,115.78
Mill requirement at 3,000 TCD tonnes	= 164 days' x 3,000 TCD	= 492,000
Cane supply deficit tonnes	= 380,115.78 – 492,000	=(**111,884)**

We projected a cane supply deficit of 111,884 tonnes by June 2021.

6.5.2. Cane projection - 2021/2022

Cane age available	= (0 -12) + (PC +R1+R2)19+ months
Area under cane available	= 6,632 Ha
Cane available	= 6,632 Ha x 63.53 Tc/Ha -111,884 Tc

= 309,446.96 Tonnes.
Mill requirement at 2,800 TCD = 280 days x 3,000 TCD = 840,000 tonnes
Cane supply deficit = (309,446.96 – 840,000) tonnes
= (**530,553) tonnes**

We projected a cane supply deficit of 530,553 Tonnes by June 2022.
The cane supply deficit will **be acute** and we recommend rigorous cane planting coupled with yield enhancement initiatives for improved raw material supply to the factory. In the short run, factory operations be adjusted to avoid milling underage cane projected available in the subsequent season.

6.6. Cane Production constraints and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Low factory efficiency and frequent factory breakdowns	The miller to address the teething problems of factory and where possible plan for replacement of obsolete spare parts	New spares are being assembled for major maintenance in April 2021
Cash flow challenges	Miliing capacity expansion and improved efficiency, lobbying for private investor to inject fresh capital	Awaiting, matter still in court for public mills leasing
Collapsed road network	County government, Kerra, and National roads board to allocate the requisite funds for roads repair	Miller to lobby the County government to prioritize roads based on both planting and harvesting program.

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	% COVERAGE

MIGORI	URIRI	682	0	682	1421	0.48	4.32
	RONGO	332	0	332	705	0.47	2.10
	SUB-TOTAL	**1,014**	**0**	**1014**	**2,126**	**0.48**	**6.42**
NAROK	TRANSMARA WEST	14,284	39	14,323	14,525	0.99	90.70
	SUB-TOTAL	**14,284**	**39**	**14,323**	**14,525**	**0.99**	**90.70**
KISII	SOUTH MUGIRANGO	455	0	455	1,162	0.39	2.88
	SUB-TOTAL	**455**	**0**	**455**	**1,162**	**0.39**	**2.88**
TOTAL		**15,753**	**39**	**15,792**	**17,813**	**0.89**	**100**

The raw material catchment for Transmara Sugar Company traversed the Counties of Narok (91%), Migori (6%) and Kisii 3%).

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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUT GROWERS	15,753	14,422.30	88.22	95.5
NUCLEUS	39	32.48	88.22	57.05
TOTAL	**15,792**	**14,454.78**	**88.22**	**95.47**

The area under cane increased by 9% to 15,792 Ha from 14,454.78 Ha reported in December 2019. This reflects on-going cane development activities in the zone.

The projected yield of 88.22 Tc/Ha was still above the industry projected productivity of 67.00 Tc/Ha. The high zonal yields were attributed to conducive weather, fertile virgin soils as well as yield enhancement initiatives by the miller.

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	6,477	20	6,497	41.14
R1	6,157	7	6,164	39.03
R2	2,293	12	2,305	14.60

R3+	826	0	826	5.23
TOTAL	**15,753**	**39**	**15,792**	**100**

The crop cycles PC: R1:R2: R3+ ratios was 41:39:15:5 compared with the industry standard of 30:30:30:10 for stable cane supply. The high proportion of plant crops could be due to sustained cane planting activities in the zone.

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	5,766	8	5,774	36.56
CO 945	4,543	11	4,554	28.84
D 84-84	3,567	3	3,570	22.61
N 14	1,055	3	1,058	6.70
KEN 82 472	734	2	736	4.66
KEN 83 737	28	1	29	0.18
MIXED	27	11	38	0.24
EAK 70 76	21	0	21	0.13
KEN 82 493	6	0	6	0.04
KEN 98 533	4	0	4	0.03
CO 617	2	0	2	0.01
TOTAL	**15,753**	**39**	**15,792**	**100**

The zonal popular varieties Co 421 occupied 37%, Co 945 -29%, D 84 84 -23%, N 14 -7% Ken 82 472 -4% among others.

The varieties diversification status in Transmara zone was 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	6,475	22	6,497	41.14
7 -12	6,157	7	6,164	39.03

13-18	2,295	10	2,305	14.60
19+	826	0	826	5.23
TOTAL	**15,753**	**39**	**15,792**	**100**

The proportion of cane 19+ months was only 5% indicative of normal harvesting ages in the zone.

7.5. Cane availability Projections

7.5.1. Cane projection - December, 2020 to June 2021

Cane age available = 13 months and above
Area under cane available = 9,642 Ha
Cane available = 9,642 Ha x 88.22 Tc/Ha = 850,617.24 tonnes.
Mill requirement at 4,000TCD = 164 days x 4,000 TCD = 656,000 tonnes
Cane supply surplus = (850,617.24 - 656,000) Tc = **194,617 tonnes**
We projected a cane supply surplus of 194,617 Tonnes by end of June 2021.

7.5.2. Cane projection - 2021/2022

Cane age available = (0 -12) + (PC +1R +2R) 19+ months
Area under cane available = 10,878 Ha
Cane available = 10,878 Ha x 88.22 Tc/Ha + 194,617 Tc
= 1,154,274.16 tonnes.
Mill requirement at 4,000 TCD = 280 days x 4,000 TCD = 1,120,000 tonnes
Cane supply surplus = (1,154,274 – 1,120,000) = **34,274 tonnes**

We projected a cane supply surplus of 34,274 Tonnes by June 2021. In general, the cane supply will be adequate for the TSCL factory.

We **recommend** sustained cane development for adequate cane supplies to the factory.

7.6. Cane production constraints in the zone and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Lack of Funding since SDL Suspended	Commercial Bank Funding	Paying Higher Interest Rate

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	6,157.73	0	6157.73	7,369	0.84	34.73
	HOMABAY TOWN	87.92	0	87.92	112	0.79	0.50
	RANGWE	128.24	0	128.24	142	0.90	0.72
	KARACHUONYO	78.95	0	78.95	104	0.76	0.45
	SUB-TOTAL	**6,452.84**	**0**	**6,452.84**	**7,727**	**0.84**	**36.39**
MIGORI	RONGO	1,693.27	0	1,693.27	1,892	**0.89**	9.55
	AWENDO	3,591.93	0	3,591.93	4,752	**0.76**	20.26
	URIRI	2,974.69	0	2,974.69	3,046	**0.98**	16.78
	SUNA EAST	132.3	0	132.3	102	**1.30**	0.75
	SUNA WEST	187.1	0	187.1	135	**1.39**	1.06
	KURIA WEST	487.28	0	487.28	312	**1.56**	2.75
	NYATIKE	224.26	0	224.26	258	**0.87**	1.26
	SUB-TOTAL	**9,290.83**	**0**	**9,290.83**	**10,497**	**0.89**	**52.39**
KISII	GUCHA	876.3	0	876.3	798	**1.10**	4.94
	SUB-TOTAL	**876.3**	**0**	**876.3**	**798**	**1.10**	**4.94**
NAROK	NAROK WEST	1,112.48	0	1,112.48	1,012	**1.10**	6.27
	SUB-TOTAL	**1,112.48**	**0**	**1,112.48**	**1,012**	**1.10**	**6.27**
TOTAL		**17,732.45**	**0**	**17,732.45**	**20,034**	**0.89**	**100.00**

The raw material catchment for Sukari Industries Ltd was in the Counties of Migori (52%), Homabay (37%), Kisii (5%) and Narok (6%).

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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUTGROWERS	17,732.45	14,687.06	67.30	48.12
NUCLEUS	0	33.8	0	84.39

TOTAL	**17,732.45**	**14,720.86**	**67.30**	**48.89**

The area under cane increased by 20% to 17,732.45 Ha from 14,720.86 Ha reported in December 2019. This was indicative of rigorous cane development activities in the zone. We **recommend** cane development be sustained for stable cane supply to the factory at all times.
We projected cane yield to increase by 38% to 67.30 Tc/Ha from 48.89 Tc/Ha realized in 2019. This improvement could be attributed to good rains received in 2020 together with the yield enhancement initiatives by the miller.

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	6,234.24	0	6,234.24	35.16
R1	4,865.000	0	4,865	27.44
R2	3,493.000	0	3,493	19.70
R3+	3,140.210	0	3,140.21	17.71
TOTAL	**17,732.45**	**0**	**1,7732.45**	**100**

The crop cycles PC:R1:R2:R3+ ratios was 35:27:20:18 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%, N 14 -3% and others 8%. The variety mix was satisfactory however efforts be put in place to introduce the local 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	4,411.79	0	4,411.79	24.88
7 -12	4,709.93	0	4,709.93	26.56
13-18	5,540.56	0	5,540.56	31.25
19+	3,070.17	0	3,070.17	17.31
TOTAL	**17,732.45**	**0**	**17,732.45**	**100**

The proportion of cane that was 19+ months old was 17% 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 2020 to June 2021

Cane age available = 13 months and above
Area under cane available = 8,611 Ha
Cane available = 8,611 Ha x 67.76 TCH = 583,483.31 tonnes.
Mill requirement at 2,800 TCD = 164 days' x 2,800 TCD = 459,200 tonnes
Cane supply surplus = 583,483.31 – 459,200 =**124,283 tonnes**
We project a cane supply surplus of 124,283 Tonnes by June 2021.

8.5.2. Cane projection - 2021/2022

Cane age available = (0 -12) + (PC +1R +2R) 19+ months
Cane available = 11,362 Ha x 67.76 Tc/Ha + 124,283 tonnes
= 894,186.26 tonnes.
Mill requirement at 2,800 TCD = 280 days x 2,800 TCD = 784,000 tonnes
Cane supply surplus = 894,186 – 784,000 = **110,186 tonnes**

We project a cane supply surplus of 110,186 Tonnes by June 2022.
We **recommend** for sustained cane development activities for sustained cane supply to the factory.

8.6. Cane Production constraints and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Collapsed and poor roads network	Lobby the Homabay County government to repair the rural access roads.	Miller to continue prioritizing sugar roads based on their harvesting program.
Inadequate extension services to farmers	Build capacities of County agriculture extension officers to train farmers.	Extension work is a devolved function to the County staff
Lack of quality seed cane	Purchase HWTP and adopt seed cane development programme	In the meantime the miller to negotiate and get heat treated seedcane from neighbours.
High cost of farm inputs especially fertilizers	Organize farmers into cooperative societies and groups to do fertiliser bulk purchase and benefit from economies of scale.	Miller has done some bulk purchase of fertilizer and is distributing to farmers at minimal fee.

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	180.17	2874.18	3,054.35	47	3.83	45.16
	LUNGALUNGA	30,73.88	626.54	3,700.42	197	15.6	54.71
	MATUGA	8.45		8.45	2	4.23	0.12
TOTAL		**3,262.5**	**3,500.72**	**6,763.22**	**246**	**13.26**	**100.00**

The raw material catchment for Kwale International Sugar Company Ltd. (KISCOL) was Kwale County in the Sub counties of Lungalunga (54.71%), Msambweni (45.16%) and Matuga (0.12%).

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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUTGROWERS	3,262.5	4,696.52	67.6	30.21
NUCLEUS	3,500.72	4,791.00	98.6	73.80
TOTAL	**6,763.22**	**9,487.52**	**80.63**	**59.18**

The area under cane declined by 29% to 6,763.22 Ha from 9,487.52 Ha reported in December 2019. The reduction in cane area was both in the nucleus and Outgrower sectors arising from ploughing out of advanced ratoons after harvesting.
We project a 36% increase in productivity to 80.63 Tc/Ha from 59.18 Tc/Ha realized in 2019. The relatively low actual yields reported during 2019 could be attributed to harvesting of over mature cane during that season.

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	746.46	280.42	1,026.88	15.18
R1	1,049.81	967.3	2,017.11	29.82
R2	958.08	394.79	1,352.87	20.00
R3+	508.15	1,858.21	2,366.36	34.99
TOTAL	**3,262.5**	**3,500.72**	**6,763.22**	**100**

The crop cycles PC: R1:R2: R3+ ratios was 15**:**30**:**20**:**35 against the industry standard of 30:30:30:10 for sustainable cane supply. The low proportion of plant crops and high proportion of ratoon 3+ is indicative of reduced cane planting in the zone.

To reverse this, we recommend enhanced cane development in the zone for sustainable cane supply to the factory.

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	2,109.15	1,657.12	3,766.27	55.69
KEN 82 808	674.44	1,229.39	1,903.83	28.15
KEN 83 737	457.41	99.91	557.32	8.24
CO 945	0	130.7	130.7	1.93
N 14	0	138.76	138.76	2.05
D 84 84	0	15.8	15.8	0.23
CB 38 22	0	8.83	8.83	0.13
MIXED	21.5	220.21	241.71	3.57
TOTAL	**3,262.5**	**3,500.72**	**6,763.22**	**100**

The varieties mix was satisfactory and popular varieties were – Co 421 (56%), KEN 82 808 (28%), KEN 83 737 (8%), N 14 (2%), Co 945 (2%) and others (4%) in small proportions.

Adoption of the local bred varieties was quite impressive at 36.39% in the zone.

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	1,598.97	243.63	1,842.6	27.24
8-13	1,657.53	3,257.09	4,914.62	72.67
14+	6	0	6	0.09
TOTAL	**3,262.50**	**3,500.72**	**6,763.22**	**100**

The proportion of cane at age cluster 14+months was low at 0.09% indicative of diminished mature cane availability.

9.5. Cane availability projections

9.5.1. Cane projection - December 2020 - June 2021

Harvesting age at the coast -14 months for Plant cane and 12 months for ratoon crops;
Available surface = 8 months and above;
Area under cane available = 6 Ha + 4,915 Ha

Cane available = 4,921 Ha x 80.63 Tc/Ha = 396,780.23 tonnes.
Mill requirement at 3,000 TCD = 132 days x 3,000 TCD =396,000Tc
Cane supply status = 396,780 Tc – 396,000 Tc
= **780 Tc.**
We project adequate cane supply by June 2021.

9.5.2. Cane projection - 2021/2022

Cane age available = (0 -7) + (PC+IR+2R) 8+ months
Area under cane available = (6 +4,915 + 1,843) Ha
Cane available = (6,764 Ha x 80.63 Tc/Ha) + 780
= 546,161.32 Tonnes.
Mill requirement at 3,000 TCD = 267 days x 3,000 TCD = 801,000 tonnes
Cane supply deficit tonnes = 546,161.32 – 801,000 Tonnes = **(254,838)**
We project a cane supply deficit of 254,838 tonnes by June 2022.
We **recommend** resumption of rigorous synchronized cane planting in the zone to normalize the crop cycles PC: R1:R2: R3+ to the industry standard of 30:30:30:10 for sustainable cane supply. Cane planting will also increase the cane area to the appropriate level for a 3,000 TCD plant.

9.6. Cane production constraints in the zone and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Land without tittle deed	Securing tittle deed with the help of County administration	Outgrower
Stay away land lords from their cane farm land	Outgrower department is in close contact with their local representatives	
Inadequate infrastructure development in the OG area- roads, culverts, bridges & drainage structures, electricity	There is an improvement, but still there is need to work in many areas. The company is using all opportunities to address the subject to County authorities	Outgrower
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,	Nucleus and Outgrowers
OG farmers low attitude to proper seed bed preparation	Farmers shall agree to undertaking proper seed bed preparation	

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	5,085.34	381.16	5,466.50	3,952	1.29	40.0
	NYANDO	2,542.67	190.58	2,733.25	2,631	0.97	20.0
	SUB TOTAL	**7,628.01**	**571.74**	**8,199.75**	**6,583**	**1.16**	**60.0**
KERICHO	KIPKELION	1,907.00	142.93	2,049.93	2,030	0.94	15.0
	AINAMOI	1,271.33	95.29	1,366.62	2,457	0.52	10.0
	SOIN/SIGOWET	1,080.63	81	1,161.63	520	2.08	8.5
	SUB TOTAL	**4,258.96**	**319.22**	**4,578.18**	**5,007**	**0.85**	**33.5**
NANDI	TINDERET	826.37	61.94	888.31	1,763	0.47	6.5
	SUB TOTAL	**826.37**	**61.94**	**888.31**	**1,763**	**0.47**	**6.5**
TOTAL		**12,713.34**	**952.90**	**13,666.24**	**13,353**	**0.95**	**100.0**

The cane area for Muhoroni sugar Company Ltd. was spread in the Counties of – Kisumu (60%), Kericho (33.5 %) and Nandi (6.5%)

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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUTGROWERS	12,713.34	12,373.05	63.19	42.96
NUCLEUS	953.07	1,206.09	63.19	19.69
TOTAL	**13,666.41**	**13,579.14**	**63.19**	**38.98**

The area under cane marginally increased by 0.64% to 13,666.41 Ha from 13,579.14 Ha reported in December 2019. This was an indication of reduced cane development activities in the zone.

We project yields to increase by 63% to 63.19 Tc/Ha from 38.98 Tc/Ha realized in 2019. This significant increase in productivity could be attributed to good rains received in 2020.

10.2. 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	2,327.77	243.1	2,570.87	18.81
R1	2,633.03	137.76	2,770.79	20.27
R2	1,762.98	160.49	1,923.47	14.08
R3+	5,989.56	411.72	6,401.28	46.84
TOTAL	**12,713.34**	**953.07**	**13,666.41**	**100**

The crop cycles PC: R1:R2: R3+ ratios was 19:20:14:47 against the industry standard of 30:30:30:10 for stable cane supply. The low proportion of PC and high proportion of R3+ could be attributed to low cane development activities in the zone over time.

We **recommend** rigorous cane development activities be initiated in the zone for improved cane supply to the factory.

10.3. Area under cane by varieties

Table 43: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 617	9,881.45	599.71	10,481.16	76.69
CO 421	1,348.1	49.87	1,397.97	10.23
CO 945	473.7	18.98	492.68	3.61
CB 38-22	377.42	184.93	562.35	4.12
KEN 83 737	567.45	65.88	633.33	4.63
OTHERS	65.22	33.7	98.92	0.72
TOTAL	**12,713.34**	**953.07**	**13,666.41**	**100**

The popular, dominant variety was Co 617 occupied 77% of the total cane area. Others were Co 421 (10%), KEN 83 737 (5%), CB 38 22 (4%), Co 945 (4%) 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.

10.4. 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	4,230.86	330.28	4,561.14	33.37
7 -12	4,174.35	291.59	4,465.94	32.68
13-18	2,342.59	160.69	2,503.28	18.32
19+	1,965.54	170.51	2,136.05	15.63
TOTAL	**12,713.34**	**953.07**	**13,666.41**	**100**

The proportion of cane that was 19+ months was 16% signifying over mature cane in the zone at the time of the survey.

10.5. Cane availability projections

10.5.1. Cane projection - Dec 2020 - June 2021

i) Muhoroni catchment

Cane age available = 13 months and above
Area under cane available = 4,639 Ha
Cane available = 4,639 Ha x 63.19 Tc/Ha
= 293,138.44 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 =1,365 Ha x 34.49 Tc/Ha
=(47,068.72 x 0.4) Tc =18,827.50 Tc

Total available cane (i + ii) = **311,965.94 Tc**
Mill requirement at 2,200 TCD = 164 days x 2,200 TCD = 360,800 tonnes
Cane supply deficit = 311,965.94 – 360,800 = (**48,834.06) tonnes**
We projected a cane supply deficit of (48,834.06) tonnes by end of June 2021.

10.5.2. Cane projection - 2021/2022

i**) Muhoroni catchment**
Cane age available = (0 -12) + (PC +R1 + R2)19+ months
Area under cane available = 10,167 Ha

Cane available = 10,167 Ha x 63.19 Tc/Ha
= 642,452.73 tonnes

ii) Miwani Nucleus

Available cane = (0-12) + (PC +R1+R2, 19+) months
= 931 Ha
Cane available =931 Ha x 34.49 Tc/Ha
= (32,110.19 x 0.4) tonnes =12,844.08 tonnes.
Total Cane available (i + ii) = (642,452.73 + 12,844.08 – 48,834.06) tonnes,
= 606,462.75 Tc

Mill requirement at 2,200TCD = 280 days x 2,200 TCD = 616,000 tonnes
Cane supply deficit = (606,462.75 - 616,000) tonnes
= (**9,537.25) tonnes**

We project a cane supply deficit of (9,537.28) tonnes by June 2022 after including the 40% of Miwani Nucleus cane production.

10.6. Cane production constraints in the zone and possible mitigation

CONSTRAINT	**MITIGATION**	**REMARKS**
Unregulated intermill cane transfer	Introduce zones	Farmers evade repaying cane development credit
Lack of funds for cane development	Re-introduce Cane development Levy	Low PC:Ratoon ratio
Poor road network	Lobby County Governent and KERRA to work on the roads	Over mature cane in a few regions
Unscheduled cane fire	Sensitize farmers to avoid cane fires	Low future cane availability
Overdue factory maintenance	Source for funds	Delayed harvesting due to low throughput.

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	1,910	1,910	-	-	100.00
	SUB TOTAL	**0**	**1,910**	**1,910**	**-**	**-**	**100.00**
TOTAL		**0**	**1,910**	**1,910**	**-**	**-**	**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-20	Dec-19	Dec-20	Dec-19
OUTGROWERS	0	0	0	0
NUCLEUS	1,909.52	1,937.94	34.49	26.55
TOTAL	**1,909.52**	**1,937.94**	**34.49**	**26.55**

The area under cane declined by 1.5% to 1,909.52 Ha from 1,937.94 Ha reported in December 2019. This reflects low cane development activities in the zone.

We project a 29.9% increase in yield to 34.49 Tc/Ha from 26.55 Tc/Ha realized in 2019. The projected yield of 34.49 Tc/Ha was however still low compared with the industry projected average yield of 67.00 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	129.85	129.85	6.80
R1	0	209.49	209.49	10.97
R2	0	378.96	378.96	19.85
R3+	0	1,191.22	1,191.22	62.38
TOTAL	**0**	**1,909.52**	**1,909.52**	**100.00**

The crop cycles PC:R1:R2:R3+ ratios was 7:11:20:62 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
CB 38 22	0	644.07	644.07	33.73
CO 617	0	491.51	491.51	25.74
CO 945	0	437.36	437.36	22.90
EAK 70 97	0	149.56	149.56	7.83
KEN 83 737	0	113.12	113.12	5.92
MIXED	0	73.90	73.90	3.87
TOTAL	**0**	**1,909.52**	**1,909.52**	**100.00**

The popular varieties were, CB 38 22 (34%), Co 617 (26%) and Co 945 (23%), EAK 70 97 (8%), KEN 83 737 (6%) and mixed 3%.
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	294.1	294.1	15.40
7 -12	0	250.57	250.57	13.12
13-18	0	409.79	409.79	21.46
19+	0	955.06	955.06	50.02
TOTAL	**0**	**1,909.52**	**1,909.52**	**100**

The proportion of 19+ months old cane was 50% 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 = 1,365 Ha x 34.49 Tc/Ha
= **47,078.85 tonnes**

11.5.2. Cane projection - 2021/2022

Available cane = (0-12) + (PC +R1+R2, 19+) months
= 931 Ha
Cane available =931 Ha x 34.49 Tc/Ha
= **32,110 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 and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Untimely payment of cane proceeds	Prompt payment for cane delivered by millers	
Inadequate resources for cane development (farm machinery, inputs)	Reistate Sugar Development Levy which used to fund cane development	

Inadequate availability of seedcane of newly released varieties	Adopt seed cane development programme	
Delayed harvesting	Plan and schedule cane supply with Neighbouring mills	
Erratic rainfall pattern	Adopt irrigation as an intervention	
Wild cane fires	Fire breaks	
Poor drainage system		
Low manual labour for field operations		
Poor road network	Liaise with the County Government of Kisumu to fix the bad roads	
Pests	Adopt Intergrated pest management approach	

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	4,487.76	635.51	5,123.27	2,667	1.68	69.43
	NYANDO	219.35	0	219.35	133	1.65	2.97
	KISUMU EAST	579.65	0	579.65	587	0.99	7.86
	KISUMU WEST	9.5	0	9.50	6	1.58	0.13
	SUB TOTAL	**5,296.26**	**635.51**	**5,931.77**	**3,393**	**1.75**	**80.39**
SIAYA	UGUNJA	**76**	**0**	**76.00**	**139**	**0.55**	**1.03**
KAKAMEGA	BUTERE	20.3	0	20.30	387	0.05	0.28
	MUMIAS EAST	15.67	0	15.67	16	0.98	0.21
	LURAMBI	6.68	0	6.68	6	1.11	0.09
	IKOLOMANI	2.4	0	2.40	2	1.20	0.03
	SUB TOTAL	**45.05**	**0**	**45.05**	**411**	0.11	**0.61**
NANDI	TINDERET	1,142.1	0	1,142.10	89	12.83	15.48
	ALDAI	55.71	0	55.71	77	0.72	0.75
	SUB TOTAL	**1,197.81**	**0**	**1,197.81**	**166**	**7.22**	**16.23**
KERICHO	AINAMOI	8.2	0	8.20	2	4.10	0.11
	SOIN/SIGOWET	120.18	0	120.18	77	1.56	1.63

	SUB TOTAL	**128.38**	**0**	**128.38**	**79**	1.63	**1.74**
TOTAL		**6,743.5**	**635.51**	**7,379.01**	**4,188**	**1.76**	**100.00**

The area under cane was spread in the Counties of Kisumu (80%), Nandi (16%), Kakamega (1%), Siaya (1%) and Kericho (2%).

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-20	Dec-19	Dec-20	Dec-19
OUTGROWERS	6,743.5	7,317.39	74.84	64.64
NUCLEUS	635.51	695.79	74.84	57.7
TOTAL	**7,379.01**	**8,013.18**	**74.84**	**63.48**

The area under cane declined by 8% to 7,379.01 Ha from 8,013.18 reported in December 2019. This was due to reduction in cane area in the Outgrowers sector.

We project an 18% increase in yield to 74.84 Tc/Ha from 63.48 Tc/Ha realized in 2019. This appreciation in productivity could be two-fold, good rains received in 2020 as well as adoption of yield enhancement initiatives in the zone.

12.2. 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	1,690.69	102.21	1,792.9	24.30
R1	1,977	133.26	2,110.26	28.60
R2	1,482.42	108.9	1,591.32	21.57
R3+	1,593.39	291.14	1,884.53	25.54
TOTAL	**6,743.5**	**635.51**	**7,379.01**	**100**

The crop cycles PC: R1:R2: R3+ ratios was 38:25:19:18 against the industry standard of 30:30:30:10 for stable cane supply. The high proportion of plant crop was due to enhanced cane development activities in the zone.

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

12.3. Area under cane by varieties

Table 53: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 617	5,127.29	389.04	5,516.33	74.76
N 14	27.91	13.46	41.37	0.56
CB 38 22	657.28	93.38	750.66	10.17
KEN 83 737	63.75	91.68	155.43	2.11
KEN 82 472	0	8.21	8.21	0.11
OTHERS	867.27	39.74	907.01	12.29
TOTAL	**6,743.5**	**635.51**	**7,379.01**	**100**

The popular variety was Co 617 (75%) followed by CB 38 22 (10%), KEN 83 737 (2%), N 14 (0.56%) and others 12.44%.

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

12.4. 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	2,081.23	245.39	2,326.62	31.53
7 -12	1969	144	2113	28.64
13-18	2,348.99	145.64	2,494.63	33.81
19+	344.28	100.48	444.76	6.03
TOTAL	**6,743.5**	**635.51**	**7,379.01**	**100**

The cane crop within age cluster 19+ months was low at 6.03% indicative of timely harvesting of mature cane in the zone.

12.5. Cane availability projections

12.5.1. Cane projection - Dec 2020 – June 2021

i) Kibos catchment

Cane age available = 13 months and above
Area under cane available = 2,940 Ha
Cane available = 2,940 Ha x 74.84 Tc/Ha
= 220,029.6 tonnes

ii) Soin catchment

Cane age available = 13 months and above
Area under cane available = 220 Ha
Cane available = 220 Ha x 67.67 Tc/Ha = 14,886.41 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 =1,365 Ha x 34.49 Tc/Ha
=(47,068.72 x 0.6)Tc =28,241.23 tonnes

Total cane available (i+ii + iii) =263,157.24
Mill cane requirement

At 3,000 TCD- 164 days x 3,000 TCD = 492,000 tonnes
Cane supply Deficit = 263,157.24 - 492,000= **(228,842) tonnes**

After inclusion of cane supply from Soin and Miwani Nucleus catchments, we project a cane supply deficit of (**228,842) tonnes** by June 2021.

12.5.2. Cane projection - 2021/2022

i) Kibos catchment

Cane age available = (0 -12) + (PC + R1 +R2)19+ months
Area under cane available = 4,874 Ha
Cane available = 4,874Ha x 74.84 Tc/Ha
= 364,770 - 228,842 tonnes
= 135,928 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
= 931 Ha
Cane available =931 Ha x 34.49 Tc/Ha
= (32,110.19 x 0.6) tonnes =19,266.11 tonnes

Total cane available (i +ii + iii) =275,585.61 Tc

Mill requirement at 3,000TCD = 280 days x 3,000 TCD
= 840,000 tonnes
Cane Supply Deficit = 275,584.61 – 840,000 tonnes
= (**564,415 tonnes**

With the inclusion of cane supplies the Soin catchment, we project a cane supply deficit of (564,415) tonnes by June 2022.

Kibos will experience the biggest **cane supply 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 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.

12.6. Cane production constraints in the zone and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Floods	Manual and mechanical drainage	Extra cost, extensive damage to cane
Poor roads network	Grading and gravelling	Weather dependent harvesting
Cane burning	Delayed payment to discourage burning	High staleness index

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	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	% COVERAGE
KAKAMEGA	BUTERE	245.12	0	245.12	526	0.47	0.50
	KAKAMEGA CENTRAL	3,623.38	0	3,623.38	7,024	0.52	7.40
	KAKAMEGA EAST	2,146.97	0	2,146.97	5,777	0.37	4.38
	KAKAMEGA NORTH	7,248.34	0	7,248.34	20,071	0.36	14.80
	NAVAKHOLO	3,142.18	0	3,142.18	4,545	0.69	6.42
	LIKUYANI	241.18	0	241.18	172	1.40	0.49
	LUGARI	3,055.88	0	3,055.88	2,368	1.29	6.24
	MUMIAS WEST	79.96	0	79.96	94	0.85	0.16
	MATUNGU	1,120.69	0	1,120.69	1,193	0.94	2.29
	MUMIAS EAST	1,086.22	0	1,086.22	1,348	0.81	2.22
	SUB-TOTAL	**21,989.92**	**0.00**	**21,989.92**	**43,118**	0.51	**44.90**
BUNGOMA	BUMULA	230.93	0	230.93	291	0.79	0.47
	BUNGOMA CENTRAL	305.58	0	305.58	493	0.62	0.62
	BUNGOMA EAST	3,843.74	0	3,843.74	9,314	0.41	7.85
	BUNGOMA NORTH	5,604.08	0	5,604.08	5,717	0.98	11.44
	BUNGOMA SOUTH	918.43	0	918.43	1,390	0.66	1.88
	BUNGOMA WEST	466.37	0	466.37	502	0.93	0.95
	KIMILILI	430.76	0	430.76	556	0.77	0.88
	KOPSIRO	65.06	0	65.06	136	0.48	0.13
	MT ELGON	289.08	0	289.08	513	0.56	0.59
	SIRISIA	121.53	0	121.53	146	0.83	0.25
	TONGAREN	3,967.67	0	3,967.67	3,495	1.14	8.10
	SUB-TOTAL	**16,243.23**	**0.00**	**16,243.23**	**22,553**	**0.72**	**33.17**
KERICHO	KERICHO	533.65	0	533.65	427	1.25	1.09
	KIPKELION WEST	488.28	0	488.28	497	0.98	1.00
	SUB-TOTAL	**1,021.93**	**0**	**1,021.93**	**924**	1.11	**2.087**
KISUMU	KISUMU EAST	54.12	0	54.12	73	0.74	0.11
	MUHORONI	570.94	0	570.94	576	0.99	1.17
	NYANDO	308.54	0	308.54	355	0.87	0.63
	SUB-TOTAL	**933.6**	**0**	**933.6**	**1004**	**0.93**	**1.91**
NANDI	MOSOP (KABIYET)	263.59	0	263.59	236	1.12	0.54
	NANDI CENTRAL	257.94	0	257.94	193	1.34	0.53
	NANDI NORTH	992.84	0	992.84	453	2.19	2.03
	NANDI SOUTH	448.45	0	448.45	321	1.40	0.92

	TINDERET	536.43	0	536.43	525	1.02	1.10
	SUB-TOTAL	**2,499.25**	**0.00**	**2,499.25**	**1,728**	**1.45**	**5.10**
TRANS NZOIA	TRANSNZOIA EAST	63.25	0	63.25	12	5.27	0.13
	KWANZA	1,821.75	0	1,821.75	165	11.04	3.72
	SABOTI	760.25	0	760.25	77	9.87	1.55
	TRANSNZOIA WEST	1,848.7	0	1,848.7	217	8.52	3.78
	SUB-TOTAL	**4,493.95**	**0**	**4,493.95**	**471**	9.54	**9.18**
UASIN GISHU	TURBO	1,788.41	0	1,788.41	296	6.04	3.65
	SUB-TOTAL	**1,788.41**	**0**	**1,788.41**	**296**	6.04	**3.65**
TOTAL		**48,970.29**	**0.00**	**48,970.29**	**70,094**	**0.70**	**100.00**

The raw material catchment for West Kenya Sugar Company Ltd. was expansive and covering the Counties of, Kakamega (45%), Bungoma (33%), Transnzoia (9%), Nandi (5%), Kisumu (2%), Uasin Gishu (4%) and Kericho (2%).

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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUTGROWERS	48,970.29	46,484.70	76.54	45.89
NUCLEUS	0	0	0	0
TOTAL	**48,970.29**	**46,484.70**	**76.54**	**45.89**

The area under cane increased by 5% to 48,970.29 Ha from 46,484.70 Ha recorded in December 2020.

We project an increase in productivity by 67% to 76.54 Tc/Ha from 45.89 Tc/Ha achieved in 2019. This could be due to the anticipated improvement in harvesting age and the good rains received during its growth stages. Fertilizers were also supplied to growers by the miller.

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	20,965.72	0	20,965.72	42.81
R1	17,757.61	0	17,757.61	36.26

R2	9,532.43	0	9,532.43	19.47
R3+	714.53	0	714.53	1.46
TOTAL	**48,970.29**	**0**	**48,970.29**	**100**

The crop cycles PC: R1:R2: R3+ ratios was 43:36:20:1 against the industry standard of 30:30:30:10 for stable cane supply. The high proportion of plant crop (43%) 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	28,847.62	0	28,847.62	58.91
CO 945	13,262.68	0	13,262.68	27.08
KEN 82 472	24.26	0	24.26	0.05
D 84 84	5.01	0	5.01	0.01
N 14	91.14	0	91.14	0.19
OTHERS	6,739.49	0	6,739.49	13.76
TOTAL	**48,970.2**	**0**	**48,970.2**	**100**

The popular variety was Co 421, (59%) followed by Co 945 (27%) and others 14%. Adoption of the local improved varieties was still low in the zone.
We **recommend** adoption of varieties diversification program to further 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	20,360.92	0	20,360.92	41.58
7 -12	16,718.11	0	16,718.11	34.14
13-18	9,896.71	0	9,896.71	20.21
19+	1,994.55	0	1,994.55	4.07
TOTAL	**48,970.29**	**0**	**48,970.29**	**100.00**

The sugarcane crop at 19+ months old represented 4% of the cane surface and was indicative of timely harvesting of mature cane in the zone.

13.5. Cane availability Projections

13.5.1. Cane Projection - Dec 2020- June 2021

Cane age available = 13 months and above
Area under cane available = 11,891 Ha
Cane available = 11,891 Ha x 0.85* x 76.54 Tc/Ha
(**Correction factor of 0.15 for overlapping in area with Butali Sugar Mills*)
= 773,621.81 tonnes

Mill requirement at 5,000 TCD = 164 days x 5,000 TCD = 820,000 tonnes
Cane supply deficit = 773,621 – 820,000 = (**46,378) tonnes**

We project a minor cane supply deficit of 46,378 tonnes by June 2021.

13.5.2. Cane Projection -2021/2022

Cane age available = (0 -12) + (PC +R1+R2)19+ months
Area under cane available = 39,073 Ha
Cane available = 39,073 Ha x 0.85 x 76.54 Tc/Ha – 46,378 Tonnes
= 2,495,689 tonnes
Mill requirement at 5,000 TCD = 280 days x 5,000 TCD = 1,400,000 tonnes

Cane supply surplus = 2,495,689 – 1,400,000 = **1,095,689 tonnes**

We project a cane supply surplus of 1,095,689 tonnes by June 2022. We recommend timely strategies be put in place to mitigate delayed harvesting associated with the envisaged sugarcane production glut.

13.6. Cane production constraints in the zone and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
1) Inadequate cane development fund	Government to allocate funds for cane development	
2) Poor road network	-Liaise with the County Government of Kakamega to fix priority roads -Reinstate Sugar Development Levy	

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	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	NO. OF GROWERS	AVERAGE CANE PLOT SIZE (HA)-OG	TOTAL (HA)	% COVERAGE
KAKAMEGA	MUMIAS EAST	0	187.10	0.00	0.00	187.10	94.55
	MATUNGU	0	10.79	0.00	0.00	10.79	5.45
	SUB-TOTAL	**0**	**197.88**	**0.00**	**0.00**	**197.88**	**100.00**
TOTAL		**0**	**197.88**	**0.00**	**0.00**	**197.88**	**100.00**

Mumias Sugar Company Nucleus Estate is in Kakamega County in the sub Counties of Mumias East (95%) and Matungu (5%).

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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUTGROWERS	0	0	0	0
NUCLEUS	197.884	1,924.63	67.98	NA
TOTAL	**197.884**	**1,924.63**	**67.98**	**NA**

The area under cane in the Nucleus Estate declined by 90% to 197.884 Ha from 1,924.63 Ha reported in December 2019 as a consequence of leaving many fields fallow. The surface of 3,207 Ha remained fallow in the course of the year.

The projected yield of 67.98 Tc/Ha was comparable with the industry projected yield of 67.00 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	197.88	197.88	100.00
R1	0		0.00	0.00

R2	0		0.00	0.00
R3+	0		0.00	0.00
TOTAL	**0**	**197.88**	**197.88**	**100**

The crop cycles PC:R1:R2:R3+ ratios was 100:0:0:0 against the industry standard of 30:30:30:10 for stable cane supply. The high plant cane ratio (100%) was indicative of resumption of cane planting after some time of no cane development activities in the zone.

14.3. Area under cane by varieties

Table 63: Area under cane by Variety

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
FR 95-2345	0	15.05	15.05	7.61
KEN 82-601	0	3.50	3.50	1.77
EAK 73 335	0	179.33	179.33	90.62
TOTAL	**0**	**197.88**	**197.88**	**100**

Planting resumed with emphasis on local improved early maturing varieties and the status was EAK 73 335 (90.62%), FR 95 2345 (7.61%) and KEN 82 601 (1.77%).

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

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	179.67	179.67	90.79
7 -12	0	18.22	18.22	9.21
13-18	0	0	0.00	0.00
19+	0	0	0.00	0.00
TOTAL	**0**	**197.88**	**197.88**	**100**

The entire sugarcane crop was within the age bracket 0 – 12 months old. This would be used for propagation or available for milling in 2021/2022 season.

14.5. Cane availability Projections

14.5.1. Cane Projections - Dec 2020 - June 2021

Cane age available = 13 months and above
Area under cane available = 0 Ha
Cane available = 0 Ha x 67.98 Tc/Ha = 0 tonnes.
Mill cane requirement at **= NIL (Factory will remain closed**)
Cane supply status = **0** (All the cane was below 13 months old)

14.5.2. Cane Projections 2021/2022

Cane age available = (0 -12) + (PC+R1+R2)19+ months
Area under cane available = 198
Cane available = 198 Ha x 67.98 Tonnes =13,460 tonnes
Mill cane requirement - =**NIL (Factory will remain closed)**
Cane supply status = 13,460 tonnes
The available cane will be supplied to the neighbouring mills especially Busia Sugar Industry Ltd.

14.6. Cane production constraints in the zone and possible mitigation

Constraint	Mitigation	Remarks
Cane Fires	• Enhance security within the N/Estate; • Engage local administration with the N/Estate Neighbors	Fires have been a perennial nuisance all along. They can only be prevented if the locals are engaged and step up security surveillance.
Cane Poaching	• Enhance security within the N/Estate; • Uproot all the illegal jaggery within the scheme	To discourage cane poaching all the jaggery plants surrounding the company be uprooted. This will reduce incidences of cane poaching and ferrying by use of motorbikes.
Lack of Funds to maintain cane	• The national Government in conjunction with the County Government to pump in money to	The Government and county Government needs to put aside a budget aiming at jump starting the company and bring it back to its foot.

	resuscitate the company.	

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	3,016.64	11.20	3,027.84	3,041	0.99	32.96
	TESO NORTH	1,297.22	0	1,297.22	1,304	0.99	14.12
	BUTULA	775	0	775	1,277	0.61	8.44
	MATAYOS	576.98	0	576.98	650	0.89	6.28
	NAMBALE	2,096.00	0	2,096.00	2,794	0.75	22.82
	SUB-TOTAL	**7,761.84**	**11.2**	**7,773.04**	**9,066**	**0.86**	**84.63**
BUNGOMA	BUMULA	774.44	0	774.44	909	0.85	8.43
	SUB-TOTAL	**774.44**	**0**	**774.44**	**909**	**0.85**	**8.43**
SIAYA	UGENYA	308	0	308	168	1.83	3.35
	SUB-TOTAL	**308**	**0**	**308**	**168**	**1.83**	**3.35**
KAKAMEGA	MATUNGU	329.6	**0**	329.6	389	0.85	3.59
	SUB-TOTAL	**329.6**	**0**	**329.6**	**389**	**0.85**	**3.59**
TOTAL		**9,173.88**	**11.2**	**9,185.08**	**10,532**	**0.87**	**100.00**

The area under cane was spread in the Counties of Busia (85%%), Bungoma (8%), Kakamega (4%) and Siaya (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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUTGROWERS	9,173.88	8,765	60.98	36.99

NUCLEUS	11.2	19	60.98	86.51
TOTAL	**9,185.08**	**8,784**	**60.98**	**37.83**

The area under cane increased by 4.6% to 9,185.08 Ha from 8,784 Ha reported in December 2019. This could be attributed to enhanced cane development activities in the zone in the Outgrowers sector.

We project a 61% increase in yield to 60.98 Tc/Ha from 37.83 Tc/Ha realized in 2019. Projected higher yields could be attributed to the anticipated appreciation in harvesting age and adequate rains received during growth stages. Fertilizer was also supplied by the miller to contracted growers.

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	2,595.9	0	2,595.9	28.26
R1	2,486.6	11.2	2,497.8	27.19
R2	1,655.2	0	1,655.2	18.02
R3+	2,436.18	0	2,436.18	26.52
TOTAL	**9,173.88**	**11.20**	**9,185.08**	**100**

The crop cycles PC:R1:R2:R3+ ratios were 28:27:18:27 against the industry standard of 30:30:30:10 for stable cane supply. The advanced ratoons (R3+) was still high requiring uprooting for replanting after harvesting.

15.3. Area under cane by varieties

Table 68: Area under cane by varieties

VARIETY	OUTGROWERS (HA)	NUCLEUS ESTATE (HA)	TOTAL (HA)	% COVERAGE
CO 945	7,563.4	11.20	7,574.6	82.47
CO 421	1,454.48	0	1,454.48	15.84
KEN 83-737	62.8	0	62.8	0.68

D 84 84	39.2	0	39.2	0.43
OTHERS	54	0	54	0.59
TOTAL	**9,173.88**	**11.2**	**9,185.08**	**100**

The popular variety was Co 945 which covered 82% of the cane area followed by Co 421 at 16% and others at 2%. The variety composition requires review to more diversification for improved for improved cane supply.

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	1,816.3	0	1,816.3	19.77
7 -12	2412	11.2	2,423.2	26.38
13-18	2911	0	2911	31.69
19+	2,034.58	0	2,034.58	22.15
TOTAL	**9,173.88**	**11.2**	**9,185.08**	**100**

The proportion of cane 19+ months old was 22.15% 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 2020- June 2021

Cane age available = 13 months and above
Area under cane available = 4,946 Ha
Cane available = 4,946 Ha x 60.98 Tc/Ha = 301,607.08 tonnes
Mill requirement at 1,250 TCD = 164 days x 1,250 TCD = 205,000 tonnes
Cane supply surplus = 301,607.08 – 205,000 = **96,596 tonnes**

We project a cane supply surplus of 96,596 tonnes by June 2021.

15.5.2. Cane Projection - 2021/2022

Cane age available = (0 -12) + (PC+R1+R2) 19+ months
Area under cane available = 5,770 Ha
Cane available = (5,770 Ha x 60.98 Tc/Ha + 96,596) tonnes
= 448,438 tonnes
Mill requirement at 1,250 TCD = 280 days x 1,250 TCD = 350,000 tonnes

Cane supply surplus = (448,438 – 350,000) = **98,438 tonnes**

We project a cane supply surplus of 98,438 tonnes by June 2022.
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 and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Delayed Harvesting	Plans have been put in place for harvesting starting with higher ages	More Cane haulage Units have been added and plans are on to increase crushing capacity.
Delayed fertilizer supply	Budget has been made however able farmers have been advised to source from nearest agro vets and also farmers have been advised to make use of available resources i.e. organic manure, filter mud and income from cane proceeds.	Fertilizer acquisition logistics have been the big cause of delay fertilizer supply
Mobility	More field staff are to be hired	Manning area per field staff will reduce thus no straining, also field staff have been requested to operate from their working areas.
Cane poaching	Staff have been requested to be vigilant on ground and report timely any poaching case so that cane can be rescued and give recovery plan for already poached cane.	Needy farmers in terms of school fees, medication and funeral, company offers advance on standing cane to avoid harvesting immature cane or cane poaching.

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	1,787.10	44.3	1,831.40	3,665	0.49	13.32
	NAMBALE	4,034.30	0	4,034.30	7,471	0.54	29.34
	TESO SOUTH	3,519.94	30	3,549.94	5,635	0.62	25.82
	TESO NORTH	108.86	0	108.86	173	0.63	0.79
	BUTULA	448.7	1.3	450	500	0.9	3.27
	FUNYULA	205.5	0	205.5	292	0.7	1.49
	SUB-TOTAL	**10,104.40**	**75.6**	**10,180.00**	**17,736**	**0.57**	**74.03**
KAKAMEGA	MUMIAS	757	0	757	329	2.3	5.5
	SUB-TOTAL	**757**	**0**	**757**	**329**	**2.3**	**5.5**
BUNGOMA	BUMULA	2,649.50	0	2,649.50	6,624	0.4	19.27
	SUB-TOTAL	**2,649.50**	**0**	**2,649.50**	**6,624**	**0.4**	**19.27**
SIAYA	UGENYA	164.9	**0**	164.9	150	1.1	1.2
	SUB-TOTAL	**164.9**	**0**	**164.9**	**150**	**1.1**	**1.2**
TOTAL		**13,675.80**	**75.6**	**13,751.40**	**24,839**	**0.55**	**100**

The raw material catchment for Busia Sugar Industry Limited (BSIL) was in the Counties of Busia (74%), Bungoma (19%), Kakamega (6%) 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-20	Dec-19	Dec-20	Dec-19
OUTGROWERS	13,675.8	14,902.20	61.62	37.25

NUCLEUS	75.6	76.6	61.62	41.22
TOTAL	**13,751.4**	**14,978.8**	**61.62**	**37.27**

The area under cane declined by 8% mainly in the Outgrowers to 13,751.4 Ha from 14,978.8 Ha reported in December 2019.

We project a 65% increase in yield to 61.62 Tc/Ha from 37.27 Tc/Ha realized in 2019. The big improvement in projected yield could be attributed to good rains received in 2020 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	3,200.6	43.3	3,243.9	23.59
R1	1,668.3	23.3	1,691.6	12.30
R2	4,711.3	5.6	4,716.9	34.30
R3+	4,095.6	3.4	4,099	29.81
TOTAL	**13,675.8**	**75.6**	**13,751.4**	**100**

The crop cycles PC: R1:R2: R3+ ratios was 24:12:34:30 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 945	13,068.7	7	13,075.7	95.09
KEN 83 737	247.8	42	289.8	2.11
D 8484	98.6	4.4	103	0.75
CO 421	77.1	0	77.1	0.56
FR 95-2345	42.3	22.2	64.5	0.47

EAK 73 335	5	0	5	0.04
Others	136.3	0	136.3	0.99
TOTAL	**13,675.8**	**75.6**	**13,751.4**	**100**

The popular variety was Co 945 at 95% coverage of the cane area followed by KEN 83 737 (3%) and others 2%.

The cane varieties mix was elaborate, however, **we recommended** deliberate efforts be made to reduce on proportion under Co 945 as they increase on other varieties.

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	8,143.4	21.7	8,165.1	59.38
7 -12	2,763.9	3.1	2767	20.12
13-18	2,479.9	50.8	2,530.7	18.40
19+	288.6	0	288.6	2.10
TOTAL	**13,675.8**	**75.6**	**13,751.4**	**100**

The crop in the age cluster 19+ months occupied 2.1 % of the cane area indicative of lack of overmature cane in the zone.

16.5. Cane availability Projections

16.5.1. Cane Projection -Dec 2020- June 2021

Cane age available = 13 months and above
Area under cane available = 2,818 Ha
Cane available = 2,818 Ha x 61.62 Tc/Ha = 173,645.16 tonnes
Mill requirement at 3,000 TCD = 164 days x 3,000 TCD = 492,000 tonnes
Cane supply Deficit = (173,662.27 – 492,000) Tc = **(318,338) tonnes**

We project a cane supply deficit of 318,338 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 = 11,134 Ha
Cane available = (11,134 Ha x 61.62 Tc/Ha) – 318,338 Tc
= 367,739 Tonnes
Mill requirement at 3,000TCD = 280 days x 3,000TCD = 840,000 tonnes

Cane supply deficit = 367,739 – 840,000 = **(472,260) tonnes**

We project a cane supply deficit of 472,260 tonnes by June 2022.

BSIL will generally experience severe cane supply deficit during the period under review. We **recommend** structured 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 and possible mitigation

CONSTRAINT	MITIGATION	REMARKS
Lack of HWTP and development of quality seed cane	Purchase and installation of hot water treatment plant	
Dependence on CO 945 variety	Diversification of a number of varieties. Establishment of variety demonstrations in various locations	
Unhealthy competition with other millers and cane poaching by jaggeries and other millers	Zoning of milling factories be allowed by government Licensing jaggeries outside factory zones	
Inadequate fertilization	Purchase and use of inorganic fertilizers Application of filter press mud	
Small cane plots due to fragmentation	Forming blocks of small plots	
Termite damage	Use of confidor chemical for control of termites	

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	8,569	1,422	9,990	6,569	1.50	57.00
	NYANDO	1,034	-	1,034	1,551	0.70	6.00
	SUB-TOTAL	**9,603**	**1,422**	**11,024**	**8,120**	**1.36**	**63.00**
NANDI	TINDERET	6,487	-	6,487	3,845	1.69	37.00
	SUB-TOTAL	**6,487**	-	**6,487**	**3,845**	**1.69**	**37.00**
TOTAL		**16,089**	**1422**	**17,511**	**11,965**	**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-20	**Dec-19**	**Dec-20**	**Dec-19**
OUTGROWERS	16,088	15,490.61	55.88	47.9
NUCLEUS	1,423	1,494.00	55.88	22.43
TOTAL	**17,511**	**16,984.61**	**55.88**	**36.7**

The area under cane increased by 3% to 17,511 Ha from 16,984.61 Ha reported in December 2019. The increase in area under cane could be attributed to cane development activities in the Outgrowers.

We project productivity to increase by 52% to 55.88 Tc/Ha from 36.7 Tc/Ha achieved in 2019.The expected increase in yield could be attributed to good rains received in the zone in 2020.

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	2,372	333	2,705	15.45
R1	2,282	173	2,455	14.02
R2	2,349	255	2,604	14.87
R3+	9,085	662	9,747	55.66
TOTAL	**16,088**	**1,423**	**17,511**	**100**

The crop cycles PC: R1:R2: R3+ ratios was 15:14:15:56 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 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
CB 38 22	592.56	864.10	1,456.66	8.32
CO 1148	86.60	0.00	86.6	0.49
CO 331	30.25	0.00	30.25	0.17
CO 421	319.22	17.70	336.92	1.92
CO 617	14,841.42	320.50	15,161.92	86.59
CO 945	23.20	47.20	70.4	0.40
KEN 82 472	7.22	0.00	7.22	0.04
KEN 82 808	25.40	0.00	25.4	0.15
KEN 83 737	118.10	62.50	180.6	1.03
EAK 70-97	10.10	16.80	26.9	0.15
D 84 84	35.20	0.00	35.2	0.20
OTHERS	0.00	92.80	92.8	0.53
TOTAL	**16,089**	**1,422**	**17,511**	**100**

The popular cultivated variety was Co 617 with a proportion coverage of 87%, followed by CB 38 22 (8%), Co 421 (2%), KEN 83 737 (1%) and others 2%.

The varieties pool was rich, however, we recommend efforts be made to reduce on proportion under Co 617 as we increase on others in the varieties pool.

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	6,502	664	7,166	40.92
7 -12	4,019	356	4,375	24.98
13-18	3,720	200	3,920	22.39
19+	1,847	203	2,050	11.71
TOTAL	**16,088**	**1,423**	**17,511**	**100**

The proportion of cane that was 0 – 12 months was 66% and will be available during 2021/2022 season.

17.5. Cane availability Projections

17.5.1. Cane projection - December 2020 -June 2021

Cane age available = 13 months and above
Area under cane available = 5,970 Ha
Cane available = 5,970 Ha x 55.88 Tc/Ha = 333,603.6 tonnes.
Mill requirement at 3,000 TCD = 164 days x 3,000 TCD = 492,000 tonnes
Cane supply deficit = 333,603 – 492,000 = (**158,396) tonnes**

We project a cane supply deficit of 158,396 tonnes by June 2021.

17.5.2. Cane projection - 2021/2022

Cane age available = (0 -12) + (PC+R1+R2)19+ months
Area under cane available = 12,572 Ha
Cane available = (12,572 Ha x 55.88 Tc/Ha – 158,396) Tc
= 544,127 tonnes.
Cane requirement at 3,000 TCD = 280 days x 3,000 TCD = 840,000 tonnes
Cane supply deficit = (544,127 – 840,000) Tc = **(295,872) tonnes**

We project a cane supply deficit of 295,872 tonnes by June 2022.

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

ii) Adjust factory operations to avoid milling young cane projected available in the subsequent season.

17.6. Cane production constraints in the zone and 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	Using 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	

APPENDIX I

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MOHAMED MWAZITO
RAMLA SALIM
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VICTOR OMALA
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END