General information

Remover name	Organic Cotton Colours			
Project code	OCCL001			
Project name	João Lourenço Gonçalves			
Location	Salgado de São Félix, Paraíba, Brazil			
Area	7.93	ha		
Start year	2024		year of planting	
Project duration	20	years		
Holding pool	20%		freed up when measurements confirm projection pathways	
Project emissions	20%		LCA estimate, or specified when >20%	

Per hectare

Baseline TEC	89	tCO2/ha	Soil Organic Carbon and Above Ground Carbon, following CDM AR-ACM0003	
Reference capacity	155	tCO2/ha	Using CEDA and Soil sample data	
Storage potential	66	tCO2/ha	Projection -/- baseline	

Per project

Projected storage	522	tCO2	storage potential per ha x area	
LCA emissions	104	tCO2	project related emissions	
Net storage potential	418	tCO2	project storage -/- emissions over 20 years	

Removal credits issued

Units first 12 years	251	units	12/20 x net storage potential	
Holding Pool	50	units	20% of the first 12 years	
Potential units issued	201	units		31.6519546 per ha

Field Code	Field name	Size (ha)	Owner			
JLC-L-001	Cotton (Algodão)	2.01	João Lourenço Gonçalves			
JLC-L-002	Beans (Feijão)	0.53	João Lourenço Gonçalves			
JLC-L-003	Corn (Milho)	0.66	João Lourenço Gonçalves			
JLC-L-004	Cotton (Algodão) 2	3	João Lourenço Gonçalves			
JLC-L-005	Corn (Milho) 2	1.73	João Lourenço Gonçalves			

#	Field code	Field	Year	Date	Sample depth (cm)	SOC/AGB/REF	SOC (%)	Organic Matter (g/kg)	Size (ha)	AGB (tCO2/ha)		Sample/report nr.	Sumproduct	Notes
	JLC-L-001	João Lourenço Gonçalves (2).kml	2024	16/2/2024	25	SOC	0.51736	8.92	7.93			[SAMPLE NUMBER]	70.7356	
	JLC-R-Field	Field Reference - NOT USED	2024				0.63336	10.92	**7.93**				86.5956	
	JLC-R-Literature	Literature Reference	2024			REF	0.936							
	JLC-L-001	Cotton (Algodão)	2020	1/1/2020		AGB			2.01	0.086			0.17286	
	JLC-L-002	Beans (Feijão)	2020	1/1/2020		AGB			0.53	1.923			1.01919	
	JLC-L-003	Corn (Milho)	2020	1/1/2020		AGB			0.66	3.257			2.14962	
	JLC-L-004	Cotton (Algodão) 2	2020	1/1/2020		AGB			3	0.22			0.66	
	JLC-L-005	Corn (Milho) 2	2020	1/1/2020		AGB			1.73	0.028			0.04844	

Step 1: Calculate the Annual Growth Rate

Given a **30% increase** over **9 years**, we use the compound growth formula:

$(1+r)^9 = 1.30$

Solving for r:

$r = (1.30)^{1/9} - 1$

$r \approx 0.029$ or 2.9% per year.

Step 2: Project SOC for 20 Years

Using this **2.9% annual increase**:

$(1+r)^{20} = (1.029)^{20}$

$(1.029)^{20} \approx 1.81$

This means that after **20 years**, the SOC is expected to increase by **81%** (or **1.81× the starting value**).

Step 3: Calculate New SOC After 20 Years

Starting SOC: **0.517%**

$\text{New SOC} = 0.517 \times 1.81$

$\text{New SOC} \approx 0.936\%$

Cotton (Algodão) 2.kml

Year	Above Ground Biomass (Mg/ha)	Carbon (Mg/ha)	CO2 Equivalent (Mg/ha)
2016	0.171	0.086	0.314
2017	0.049	0.024	0.090
2018	0.096	0.048	0.177
2019	0.141	0.071	0.259
2020	0.143	0.071	0.262
Average	0.120	0.060	0.220

Cotton (Algodão).kml

Year	Above Ground Biomass (Mg/ha)	Carbon (Mg/ha)	CO2 Equivalent (Mg/ha)
2016	0.000	0.000	0.000
2017	0.078	0.039	0.143
2018	0.039	0.020	0.072
2019	0.027	0.013	0.049
2020	0.090	0.045	0.166
Average	0.047	0.023	0.086

Feijão (Beans).kml

Year	Above Ground Biomass (Mg/ha)	Carbon (Mg/ha)	CO2 Equivalent (Mg/ha)
2016	0.000	0.000	0.000
2017	0.048	0.024	0.089
2018	0.048	0.024	0.089
2019	2.068	1.034	3.791
2020	3.079	1.540	5.646
Average	1.049	0.524	1.923

Milho (Corn) 2.kml

Year	Above Ground Biomass (Mg/ha)	Carbon (Mg/ha)	CO2 Equivalent (Mg/ha)
2016	0.000	0.000	0.000
2017	0.000	0.000	0.000
2018	0.000	0.000	0.000
2019	0.000	0.000	0.000
2020	0.076	0.038	0.140
Average	0.015	0.008	0.028

Milho (Corn).kml

Year	Above Ground Biomass (Mg/ha)	Carbon (Mg/ha)	CO2 Equivalent (Mg/ha)
2016	0.000	0.000	0.000
2017	0.553	0.277	1.014
2018	0.494	0.247	0.906
2019	3.423	1.712	6.276
2020	4.412	2.206	8.088
Average	1.776	0.888	3.257

Step 1: Define the Rate of Decline

We assume a linear decrease in SOC improvement from 55% at 5 cm to 20% at 40 cm:

\text{Rate of decline} = \frac{(55\% - 20\%)}{(40 \text{ cm} - 5 \text{ cm})} = \frac{35\%}{35 \text{ cm}} = 1\% \text{ per cm}

Step 2: Estimate at 30 cm Depth

Since 30 cm is 25 cm deeper than 5 cm, we apply the rate of decline:

\text{SOC increase at 30 cm} = 55\% - (25 \times 1\%)

= 55\% - 25\% = 30\%

Conclusion:

After 9 years, the estimated SOC increase at 30 cm depth is approximately 30%, assuming a linear decline in improvement with depth.

Carbon Calculation for		**OCCL001**									
Surface	7.93	ha	Fields tab								
Capacity Reference SOC	0.94	SOC %	References tab								
Capacity Reference AGB	0.51	tCO2e/ha	References tab								
	2024			**2027**		**2030**		**2033**		**2036**	
Measurement average	0.51736	SOC %		#DIV/0!	SOC g/kg	#DIV/0!	SOC g/kg	#DIV/0!	SOC g/kg	#DIV/0!	SOC g/kg
Sample depth	30	cm		#DIV/0!	cm	#DIV/0!	cm	#DIV/0!	cm	#DIV/0!	cm
Calculation depth	30	cm		30	cm	30	cm	30	cm	30	cm
Soil density	1.555	g/cm3		#DIV/0!	g/cm3	#DIV/0!	g/cm3	#DIV/0!	g/cm3	#DIV/0!	g/cm3
Soil density REF	1.499	g/cm3									
SOC (soil carbon) / ha	88	tCO2e/ha		#DIV/0!	tCO2e/ha	#DIV/0!	tCO2e/ha	#DIV/0!	tCO2e/ha	#DIV/0!	tCO2e/ha
Soil Carbon per ha REF	154.34	tCO2e/ha									
AGB (above ground) / ha	0.51	tCO2e/ha		#DIV/0!	tCO2e/ha	#DIV/0!	tCO2e/ha	#DIV/0!	tCO2e/ha	#DIV/0!	tCO2e/ha
Storage current	706	tCO2e		#DIV/0!	tCO2e	#DIV/0!	tCO2e	#DIV/0!	tCO2e	#DIV/0!	tCO2e
Storage capacity	1,228	tCO2e		#N/A	tCO2e	#N/A	tCO2e	#N/A	tCO2e	#N/A	tCO2e

Sources											
value	**source**	**URL**	Notes								
CEDA aboveground biomass carbon	https://climatee	https://dataceda	2018 data								
SOC	A critical review of the conventional SOC to SOM conversion factor (Geoderma,Volume 156, Issues 3–4, 15 May 2010, Pages 75-83)										
Density	Wageningen Ur	https://edepot.wu	We've added these soil density levels to the calculation factors tab								
Reference data for capacity											
SOC (soil)	0.936	SOC %	https://www.researchgate.net/publication/336428749_Soil_carbon_accumulation_in_cotton_production_systems_in_the_Brazilian_Cerrado								
AGB (above ground)	0.51	tCO2e/ha	*Extremely arid environment								

from C to CO2	3.666666667		
soil density	% organic matter	% organic carbon	soil density
1.59	0.5	0.25	1.59
1.583	0.6	0.3	1.583
1.576	0.7	0.35	1.576
1.569	0.8	0.4	1.569
1.562	0.9	0.45	1.562
1.555	1	0.5	1.555
1.548	1.1	0.55	1.548
1.541	1.2	0.6	1.541
1.534	1.3	0.65	1.534
1.527	1.4	0.7	1.527
1.52	1.5	0.75	1.52
1.513	1.6	0.8	1.513
1.506	1.7	0.85	1.506
1.499	1.8	0.9	1.499
1.492	1.9	0.95	1.492
1.485	2	1	1.485
1.478	2.1	1.05	1.478
1.471	2.2	1.1	1.471
1.464	2.3	1.15	1.464
1.457	2.4	1.2	1.457
1.45	2.5	1.25	1.45
1.444	2.6	1.3	1.444
1.438	2.7	1.35	1.438
1.432	2.8	1.4	1.432
1.426	2.9	1.45	1.426
1.42	3	1.5	1.42
1.414	3.1	1.55	1.414
1.408	3.2	1.6	1.408
1.402	3.3	1.65	1.402
1.396	3.4	1.7	1.396
1.39	3.5	1.75	1.39
1.385	3.6	1.8	1.385
1.38	3.7	1.85	1.38
1.375	3.8	1.9	1.375
1.37	3.9	1.95	1.37
1.365	4	2	1.365
1.36	4.1	2.05	1.36
1.355	4.2	2.1	1.355
1.35	4.3	2.15	1.35
1.345	4.4	2.2	1.345
1.34	4.5	2.25	1.34
1.335	4.6	2.3	1.335
1.33	4.7	2.35	1.33
1.325	4.8	2.4	1.325
1.32	4.9	2.45	1.32
1.315	5	2.5	1.315
1.31	5.1	2.55	1.31
1.305	5.2	2.6	1.305
1.3	5.3	2.65	1.3
1.295	5.4	2.7	1.295
1.29	5.5	2.75	1.29
1.285	5.6	2.8	1.285
1.28	5.7	2.85	1.28
1.275	5.8	2.9	1.275
1.27	5.9	2.95	1.27
1.265	6	3	1.265
1.26	6.1	3.05	1.26
1.255	6.2	3.1	1.255
1.25	6.3	3.15	1.25
1.245	6.4	3.2	1.245
1.24	6.5	3.25	1.24
1.234	6.6	3.3	1.234
1.228	6.7	3.35	1.228
1.222	6.8	3.4	1.222
1.216	6.9	3.45	1.216
1.21	7	3.5	1.21
1.204	7.1	3.55	1.204
1.198	7.2	3.6	1.198
1.192	7.3	3.65	1.192
1.186	7.4	3.7	1.186
1.18	7.5	3.75	1.18
1.175	7.6	3.8	1.175
1.17	7.7	3.85	1.17
1.165	7.8	3.9	1.165
1.16	7.9	3.95	1.16
1.155	8	4	1.155
1.15	8.1	4.05	1.15
1.145	8.2	4.1	1.145
1.14	8.3	4.15	1.14
1.135	8.4	4.2	1.135
1.13	8.5	4.25	1.13
1.126	8.6	4.3	1.126
1.122	8.7	4.35	1.122
1.118	8.8	4.4	1.118
1.114	8.9	4.45	1.114
1.11	9	4.5	1.11
1.106	9.1	4.55	1.106
1.102	9.2	4.6	1.102
1.098	9.3	4.65	1.098
1.094	9.4	4.7	1.094
1.09	9.5	4.75	1.09
1.086	9.6	4.8	1.086
1.082	9.7	4.85	1.082
1.078	9.8	4.9	1.078
1.074	9.9	4.95	1.074
1.07	10	5	1.07
1.066	10.1	5.05	1.066
1.062	10.2	5.1	1.062
1.058	10.3	5.15	1.058
1.054	10.4	5.2	1.054
1.05	10.5	5.25	1.05
1.046	10.6	5.3	1.046
1.042	10.7	5.35	1.042
1.038	10.8	5.4	1.038
1.034	10.9	5.45	1.034
1.03	11	5.5	1.03
1.026	11.1	5.55	1.026
1.022	11.2	5.6	1.022
1.018	11.3	5.65	1.018
1.014	11.4	5.7	1.014
1.01	11.5	5.75	1.01
1.005	11.6	5.8	1.005
1	11.7	5.85	1
0.995	11.8	5.9	0.995
0.99	11.9	5.95	0.99
0.985	12	6	0.985
0.98	12.1	6.05	0.98
0.975	12.2	6.1	0.975
0.97	12.3	6.15	0.97
0.965	12.4	6.2	0.965
0.96	12.5	6.25	0.96
0.957	12.6	6.3	0.957
0.954	12.7	6.35	0.954
0.951	12.8	6.4	0.951
0.948	12.9	6.45	0.948
0.945	13	6.5	0.945
0.942	13.1	6.55	0.942
0.939	13.2	6.6	0.939
0.936	13.3	6.65	0.936
0.933	13.4	6.7	0.933
0.93	13.5	6.75	0.93
0.927	13.6	6.8	0.927
0.924	13.7	6.85	0.924
0.921	13.8	6.9	0.921
0.918	13.9	6.95	0.918
0.915	14	7	0.915
0.912	14.1	7.05	0.912
0.909	14.2	7.1	0.909
0.906	14.3	7.15	0.906
0.903	14.4	7.2	0.903
0.9	14.5	7.25	0.9
0.897	14.6	7.3	0.897
0.894	14.7	7.35	0.894
0.891	14.8	7.4	0.891
0.888	14.9	7.45	0.888
0.885	15	7.5	0.885
0.882	15.1	7.55	0.882
0.879	15.2	7.6	0.879
0.876	15.3	7.65	0.876
0.873	15.4	7.7	0.873
0.87	15.5	7.75	0.87
0.867	15.6	7.8	0.867
0.864	15.7	7.85	0.864
0.861	15.8	7.9	0.861
0.858	15.9	7.95	0.858
0.855	16	8	0.855
0.852	16.1	8.05	0.852
0.849	16.2	8.1	0.849
0.846	16.3	8.15	0.846
0.843	16.4	8.2	0.843
0.84	16.5	8.25	0.84
0.837	16.6	8.3	0.837
0.834	16.7	8.35	0.834
0.831	16.8	8.4	0.831
0.828	16.9	8.45	0.828
0.825	17	8.5	0.825
0.822	17.1	8.55	0.822
0.819	17.2	8.6	0.819
0.816	17.3	8.65	0.816
0.813	17.4	8.7	0.813

0.81	17.5	8.75	0.81
0.808	17.6	8.8	0.808
0.806	17.7	8.85	0.806
0.804	17.8	8.9	0.804
0.802	17.9	8.95	0.802
0.8	18	9	0.8
0.798	18.1	9.05	0.798
0.796	18.2	9.1	0.796
0.794	18.3	9.15	0.794
0.792	18.4	9.2	0.792
0.79	18.5	9.25	0.79
0.788	18.6	9.3	0.788
0.786	18.7	9.35	0.786
0.784	18.8	9.4	0.784
0.782	18.9	9.45	0.782
0.78	19	9.5	0.78
0.778	19.1	9.55	0.778
0.776	19.2	9.6	0.776
0.774	19.3	9.65	0.774
0.772	19.4	9.7	0.772
0.77	19.5	9.75	0.77
0.768	19.6	9.8	0.768
0.766	19.7	9.85	0.766
0.764	19.8	9.9	0.764
0.762	19.9	9.95	0.762
0.76	20	10	0.76
0.758	20.1	10.05	0.758
0.756	20.2	10.1	0.756
0.754	20.3	10.15	0.754
0.752	20.4	10.2	0.752
0.75	20.5	10.25	0.75
0.748	20.6	10.3	0.748
0.746	20.7	10.35	0.746
0.744	20.8	10.4	0.744
0.742	20.9	10.45	0.742
0.74	21	10.5	0.74
0.738	21.1	10.55	0.738
0.736	21.2	10.6	0.736
0.734	21.3	10.65	0.734
0.732	21.4	10.7	0.732
0.73	21.5	10.75	0.73
0.728	21.6	10.8	0.728
0.726	21.7	10.85	0.726
0.724	21.8	10.9	0.724
0.722	21.9	10.95	0.722
0.72	22	11	0.72
0.718	22.1	11.05	0.718
0.716	22.2	11.1	0.716
0.714	22.3	11.15	0.714
0.712	22.4	11.2	0.712
0.71	22.5	11.25	0.71
0.709	22.6	11.3	0.709
0.708	22.7	11.35	0.708
0.707	22.8	11.4	0.707
0.706	22.9	11.45	0.706
0.705	23	11.5	0.705
0.704	23.1	11.55	0.704
0.703	23.2	11.6	0.703
0.702	23.3	11.65	0.702
0.701	23.4	11.7	0.701
0.7	23.5	11.75	0.7
0.699	23.6	11.8	0.699
0.698	23.7	11.85	0.698
0.697	23.8	11.9	0.697
0.696	23.9	11.95	0.696
0.695	24	12	0.695
0.694	24.1	12.05	0.694
0.693	24.2	12.1	0.693
0.692	24.3	12.15	0.692
0.691	24.4	12.2	0.691
0.69	24.5	12.25	0.69
0.688	24.6	12.3	0.688
0.686	24.7	12.35	0.686
0.684	24.8	12.4	0.684
0.682	24.9	12.45	0.682
0.68	25	12.5	0.68
0.678	25.1	12.55	0.678
0.676	25.2	12.6	0.676
0.674	25.3	12.65	0.674
0.672	25.4	12.7	0.672
0.67	25.5	12.75	0.67
0.668	25.65	12.825	0.668
0.666	25.8	12.9	0.666
0.664	25.95	12.975	0.664
0.662	26.1	13.05	0.662
0.66	26.25	13.125	0.66
0.658	26.4	13.2	0.658
0.656	26.55	13.275	0.656
0.654	26.7	13.35	0.654
0.652	26.85	13.425	0.652
0.65	27	13.5	0.65
0.647	27.2	13.6	0.647
0.644	27.4	13.7	0.644
0.641	27.6	13.8	0.641
0.638	27.8	13.9	0.638
0.635	28	14	0.635
0.632	28.2	14.1	0.632
0.629	28.4	14.2	0.629
0.626	28.6	14.3	0.626
0.623	28.8	14.4	0.623
0.62	29	14.5	0.62
0.618	29.2	14.6	0.618
0.616	29.4	14.7	0.616
0.614	29.6	14.8	0.614
0.612	29.8	14.9	0.612
0.61	30	15	0.61
0.608	30.2	15.1	0.608
0.606	30.4	15.2	0.606
0.604	30.6	15.3	0.604
0.602	30.8	15.4	0.602
0.6	31	15.5	0.6
0.598	31.2	15.6	0.598
0.596	31.4	15.7	0.596
0.594	31.6	15.8	0.594
0.592	31.8	15.9	0.592
0.59	32	16	0.59
0.588	32.2	16.1	0.588
0.586	32.4	16.2	0.586
0.584	32.6	16.3	0.584
0.582	32.8	16.4	0.582
0.58	33	16.5	0.58
0.578	33.2	16.6	0.578
0.576	33.4	16.7	0.576
0.574	33.6	16.8	0.574
0.572	33.8	16.9	0.572
0.57	34	17	0.57
0.568	34.2	17.1	0.568
0.566	34.4	17.2	0.566
0.564	34.6	17.3	0.564
0.562	34.8	17.4	0.562
0.56	35	17.5	0.56
0.558	35.2	17.6	0.558
0.556	35.4	17.7	0.556
0.554	35.6	17.8	0.554
0.552	35.8	17.9	0.552
0.55	36	18	0.55
0.548	36.2	18.1	0.548
0.546	36.4	18.2	0.546
0.544	36.6	18.3	0.544
0.542	36.8	18.4	0.542
0.54	37	18.5	0.54
0.538	37.2	18.6	0.538
0.536	37.4	18.7	0.536
0.534	37.6	18.8	0.534
0.532	37.8	18.9	0.532
0.53	38	19	0.53
0.528	38.2	19.1	0.528
0.526	38.4	19.2	0.526
0.524	38.6	19.3	0.524
0.522	38.8	19.4	0.522
0.52	39	19.5	0.52
0.518	39.2	19.6	0.518
0.516	39.4	19.7	0.516
0.514	39.6	19.8	0.514
0.512	39.8	19.9	0.512
0.51	40	20	0.51
0.508	40.2	20.1	0.508
0.506	40.4	20.2	0.506
0.504	40.6	20.3	0.504
0.502	40.8	20.4	0.502
0.5	41	20.5	0.5
0.499	41.2	20.6	0.499
0.498	41.4	20.7	0.498
0.497	41.6	20.8	0.497
0.496	41.8	20.9	0.496
0.495	42	21	0.495
0.494	42.2	21.1	0.494
0.493	42.4	21.2	0.493
0.492	42.6	21.3	0.492
0.491	42.8	21.4	0.491
0.49	43	21.5	0.49
0.488	43.2	21.6	0.488

0.486	43.4	21.7	0.486
0.484	43.6	21.8	0.484
0.482	43.8	21.9	0.482
0.48	44	22	0.48
0.478	44.2	22.1	0.478
0.476	44.4	22.2	0.476
0.474	44.6	22.3	0.474
0.472	44.8	22.4	0.472
0.47	45	22.5	0.47
0.469	45.2	22.6	0.469
0.468	45.4	22.7	0.468
0.467	45.6	22.8	0.467
0.466	45.8	22.9	0.466
0.465	46	23	0.465
0.464	46.2	23.1	0.464
0.463	46.4	23.2	0.463
0.462	46.6	23.3	0.462
0.461	46.8	23.4	0.461
0.46	47	23.5	0.46
0.458	47.2	23.6	0.458
0.456	47.4	23.7	0.456
0.454	47.6	23.8	0.454
0.452	47.8	23.9	0.452
0.45	48	24	0.45
0.448	48.2	24.1	0.448
0.446	48.4	24.2	0.446
0.444	48.6	24.3	0.444
0.442	48.8	24.4	0.442
0.44	49	24.5	0.44