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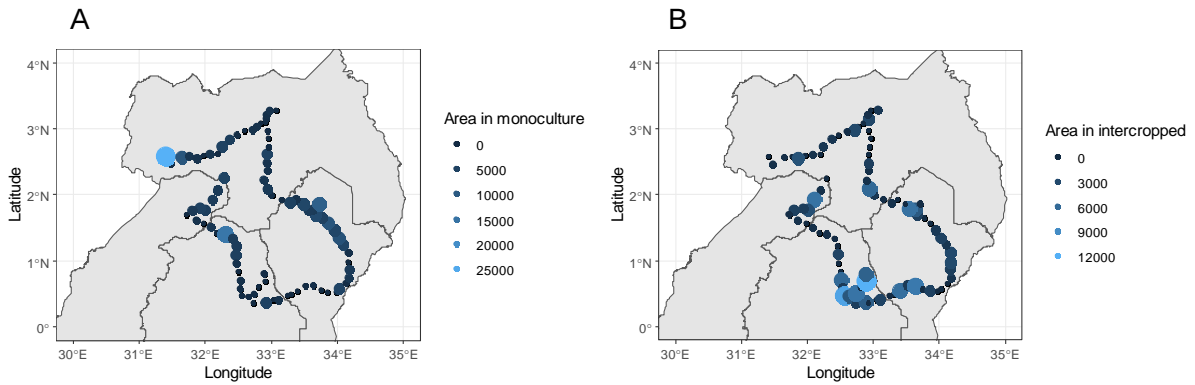
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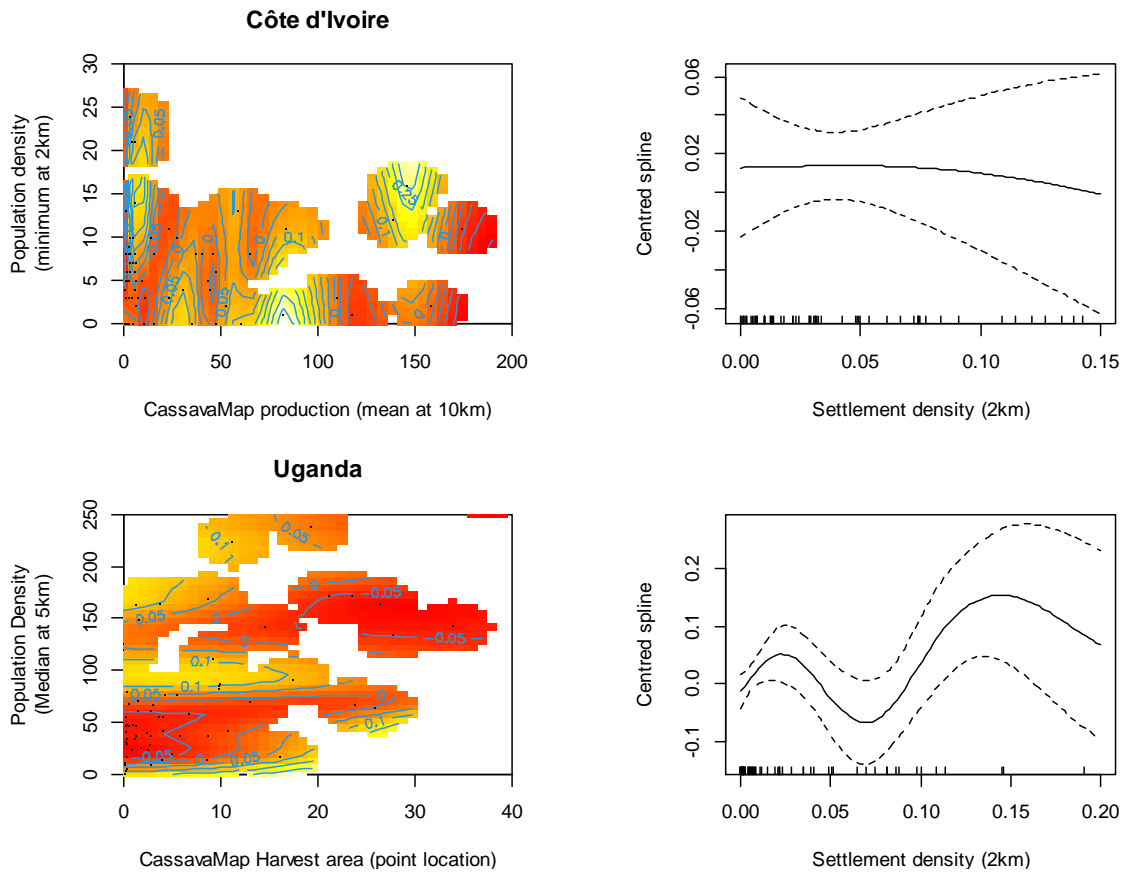
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1 **Supporting information - Validating a**  
 2 **cassava spatial disaggregation model in**  
 3 **sub-Saharan Africa**  
 4



5 **S1 Fig.** Area under monoculture (A) or intercropped (B) cassava production at each survey  
 6 location in Uganda.  
 7  
 8



9  
 10 **S2 Fig.** Fitted smooth functions to the models with the best AIC scores. The top panel  
 11 represents results for survey data from Côte d'Ivoire with the top-left showing the 2-

12 dimensional smooth fitted between CassavaMap production and population density whilst  
 13 the top-right shows the 1-dimensional smooth fitted to the settlement density. The bottom  
 14 panel represents results from Uganda with bottom-left showing the 2-dimensional smooth  
 15 fitted between CassavaMap harvest area and population density and bottom-right showing  
 16 the 1-dimensional smooth fitted to the settlement density.

17  
 18 **S1 Table.** List of all possible covariates extracted from raster layers associated with  
 19 CassavaMap predictions, population densities and settlement densities respectively.  
 20 Extracted covariates are different summary statistics of a buffered region at 2, 5 and 10km  
 21 about each survey point. Only one term from each column is included in the regression  
 22 modelling at a time.

CassavaMap predictions			Population summaries		Settlement summaries	
Prediction Type	Buffer Distance (km)	Summary Statistic	Buffer Distance (km)	Summary Statistic	Buffer Distance (km)	Summary Statistic
Production	0	Point prediction	0	Point prediction	2	mean
Production	2	mean	2	mean	5	mean
Production	5	mean	5	mean	10	mean
Production	10	mean	10	mean		
Production	2	sd	2	sd		
Production	5	sd	5	sd		
Production	10	sd	10	sd		
Production	2	minimum	2	minimum		
Production	5	minimum	2	lower quartile		
Production	2	lower quartile	5	lower quartile		
Production	5	lower quartile	10	lower quartile		
Production	10	lower quartile	2	median		
Production	2	median	5	median		
Production	5	median	10	median		
Production	10	median	2	upper quartile		
Production	2	upper quartile	5	upper quartile		
Production	5	upper quartile	10	upper quartile		
Production	10	upper quartile	2	maximum		
Production	2	maximum	5	maximum		
Production	5	maximum	10	maximum		

Production	10	maximum Point prediction
Harvest Area	0	mean
Harvest Area	2	mean
Harvest Area	5	mean
Harvest Area	10	mean
Harvest Area	2	sd
Harvest Area	5	sd
Harvest Area	10	sd
Harvest Area	2	minimum
Harvest Area	5	minimum
Harvest Area	2	lower quartile
Harvest Area	5	lower quartile
Harvest Area	10	lower quartile
Harvest Area	2	median
Harvest Area	5	median
Harvest Area	10	median
Harvest Area	2	upper quartile
Harvest Area	5	upper quartile
Harvest Area	10	upper quartile
Harvest Area	2	maximum
Harvest Area	5	maximum
Harvest Area	10	maximum

23  
24

25 **S2 Table.** ANOVA results from analysing cassava production variables against distinct  
 26 administrative zones in Côte d'Ivoire.

Response variable	Transformation	NDF, DDF	F value	p-value
total area under cassava production	square root	8, 60	1.88	0.079
total area under cassava monoculture	square root	8, 60	1.83	0.090
total area under cassava intercropping	square root	8, 60	1.44	0.200

27

28 **S3 Table.** ANOVA results from analysing cassava production variables across distinct  
 29 administrative regions in Uganda.

Response variable	Transformation	NDF, DDF	F value	p-value
total area under cassava production	square root	3, 83	1.83	0.147
total area under cassava monoculture	square root	3, 83	1.05	0.375
total area under cassava intercropping	square root	3, 83	2.62	0.056

30

**S4 Table.** Type-II ANOVA tables for the AIC and adjusted R<sup>2</sup> extracted from all individual models fitted to Côte d'Ivoire. Only F-statistics are shown, with 31026 residual degrees of freedom, most terms greater than 1 are significant.

Term	D F	Total cassava area		Total monoculture area		Total intercropped area		Total cassava area (weighted)		Total monoculture area (weighted)		Total intercropped area (weighted)	
		F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)
modeltype	1	8061.2	15104.3	24732.7	50011.9	1058.4		17717.2	31902.9	37548.2	63331.4	3083.0	
cass_type	1	0.51	10.78	774.36	508.57	102.12	351.62	161.84	89.00	842.81	427.06	82.24	164.25
population_type	1	799.62	134.20	16.17	0.54	6	697.07	202.62	34.98	6.10	0.25	877.43	399.75
settlement_type	1	7	5.15	35.18	0.22	5	1588.73	300.54	0.79	1.36	5.16	7	1090.27
cass_dist	3	875.69	1186.70	640.50	1593.68	345.18	779.12	1005.23	2200.74	877.72	1986.13	213.02	834.79
cass_summary	6	8	2010.12	632.37	1100.35	422.96	322.85	1847.01	2672.92	1010.00	1736.01	339.13	308.56
cass_type:population_type	1	2.81	3.27	0.23	0.21	0.41	0.21	0.32	0.50	0.78	0.13	0.85	1.15
cass_type:settlement_type	1	1.23	5.73	9.05	0.01	12.34	28.11	0.37	11.13	4.80	0.66	8.96	17.21
population_type:settlement_type	1	27.52	14.81	0.18	0.20	34.49	58.83	6.93	6.92	0.19	0.10	17.12	23.37
cass_dist:cass_summary	1	488.61	485.16	120.84	204.27	339.17	215.51	425.76	523.83	127.91	241.04	577.54	441.96
cass_type:cass_dist	3	16.98	18.55	34.16	111.02	795.11	728.77	29.59	28.49	50.59	138.86	681.69	661.31
cass_type:cass_summary	6	31.85	56.00	69.87	121.79	151.68	63.07	51.59	108.45	126.42	147.19	338.33	104.16
population_type:population_dist	3	135.05	191.29	324.67	192.40	125.80	390.00	108.88	118.88	195.36	98.10	99.27	266.63
population_type:population_summary	6	53.53	61.30	252.14	274.29	71.41	192.03	35.85	47.69	212.48	199.09	39.81	98.18
settlement_type:settlement_dist	2	916.27	865.56	38.97	323.10	101.60	470.08	284.74	426.09	5.23	167.57	16.89	88.35
modeltype:cass_type	1	50.53	264.57	1043.23	811.80	145.96	527.51	459.01	598.58	1246.54	840.24	116.92	232.62
modeltype:population_type	1	0.18	6.38	33.41	62.38	34.05	26.62	2.69	23.28	33.15	65.61	34.98	25.89
modeltype:settlement_type	1	221.78	319.98	211.75	184.11	50.94	63.86	285.01	303.77	260.14	180.13	109.39	182.97
modeltype:cass_dist	3	272.90	236.80	252.00	225.33	601.27	946.36	301.86	358.90	392.93	197.48	307.13	965.18
modeltype:cass_summary	6	342.38	212.14	710.28	687.13	496.95	275.41	657.96	391.53	948.80	691.03	480.67	414.23
cass_type:population_type:settlement_type	1	0.22	0.12	0.37	0.84	0.11	0.08	0.29	0.15	0.72	1.32	0.02	0.01
cass_type:cass_dist:cass_summary	1	35.16	36.91	25.39	48.92	358.43	212.11	47.73	60.49	31.94	64.38	353.38	270.13
population_type:population_dist:population_summary	0	105.80	133.70	182.11	227.28	21.45	68.62	93.79	125.73	109.82	155.05	13.05	36.48
modeltype:cass_type:population_type	1	0.29	0.67	1.81	1.02	0.96	0.81	1.52	4.37	3.64	1.49	2.19	3.41
modeltype:cass_type:settlement_type	1	17.87	16.18	32.93	19.20	26.85	58.02	12.56	6.09	21.50	11.28	17.55	32.95
modeltype:population_type:settlement_type	1	2.02	0.01	0.01	0.89	9.18	4.63	0.01	2.15	0.29	2.94	5.14	2.88
modeltype:cass_dist:cass_summary	1	236.59	156.48	116.83	177.23	543.30	361.12	275.63	211.27	140.64	201.73	917.69	712.30
modeltype:cass_type:cass_dist	3	46.32	94.61	50.02	138.33	2	837.69	77.58	127.81	70.02	165.08	935.06	788.93

modeltype:cass_type:cass_summary	6	15.69	48.50	96.10	193.78	292.18	124.37	70.29	85.73	197.82	243.81	582.04	190.05
modeltype:population_type:population_dist	3	94.91	108.59	468.87	191.61	49.39	157.19	148.52	96.21	309.47	112.63	44.11	122.20
modeltype:population_type:population_summary	6	63.63	110.01	349.11	350.94	46.75	112.14	92.86	146.25	354.78	336.00	31.83	75.25
modeltype:settlement_type:settlement_dist	2	211.52	343.79	37.86	117.40	44.13	92.22	86.49	183.72	87.55	164.62	42.10	62.30
modeltype:cass_type:population_type:settlement_type	1	0.03	0.00	0.14	0.06	0.00	0.39	0.06	0.08	0.64	0.36	0.03	0.33
	1												
modeltype:cass_type:cass_dist:cass_summary	1	41.41	32.33	18.64	10.74	556.43	331.25	56.86	37.15	23.49	9.34	551.68	420.97
	1												
modeltype:population_type:population_dist:population_summary	0	30.54	51.76	114.32	26.75	8.78	13.21	45.03	43.63	77.37	25.84	2.67	6.15

**S5 Table.** Type-II ANOVA tables for the AIC and adjusted R<sup>2</sup> extracted from all individual models fitted to Uganda. Only F-statistics are shown, with 31026 residual degrees of freedom, most terms greater than 1 are significant.

Term	D F	Total cassava area		Total monoculture area		Total intercropped area		Total cassava area (weighted)		Total monoculture area (weighted)		Total intercropped area (weighted)	
		F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)	F (AIC)	F (adj. R2)
modeltype	1	9746.5	21637.7	3883.3	7134.99	16627.4	15478.7	8318.5	18356.2	3686.50	7692.37	16299.7	15788.4
cass_type	1	148.29	379.04	1.72	0.01	3.95	15.67	139.35	290.76	1.77	3.61	7.45	20.35
population_type	1	132.79	97.04	2.85	134.19	83.50	279.23	158.31	86.74	4.74	136.37	83.13	279.42
settlement_type	1	552.83	315.49	57.07	2468.21	3380.02	6662.35	992.23	679.83	69.45	2596.83	3333.40	6488.36
cass_dist	3	9	1344.58	1	2701.69	2963.41	106.17	2	1735.99	6	2362.58	2989.16	111.17
cass_summary	6	162.13	544.15	180.25	101.79	14.58	13.84	141.71	536.66	172.95	94.29	14.36	11.69
cass_type:population_type	1	0.05	0.41	0.03	0.48	0.45	2.27	0.01	2.55	0.00	0.29	0.32	2.07
cass_type:settlement_type	1	6.73	14.97	10.90	18.66	0.25	2.59	11.83	21.42	12.02	25.49	0.13	2.07
population_type:settlement_type	1	0.67	0.83	74.45	476.17	14.29	111.11	9.66	11.14	96.96	474.79	13.64	106.33
cass_dist:cass_summary	1	267.13	331.19	585.31	519.46	11.31	9.42	441.99	492.60	641.46	522.96	9.11	8.71
cass_type:cass_dist	3	8.12	18.00	18.87	6.24	2.59	0.45	6.78	8.78	50.78	12.76	1.72	0.46
cass_type:cass_summary	6	63.99	41.88	81.03	72.62	56.24	29.80	92.66	57.23	121.79	98.40	47.92	27.87
population_type:population_dist	3	274.58	382.89	104.00	241.06	356.11	739.99	203.76	350.68	111.91	216.96	328.63	730.65
population_type:population_summary	6	190.67	287.67	109.17	360.62	308.08	360.62	143.13	235.72	133.45	396.03	278.15	337.84
settlement_type:settlement_dist	2	101.67	251.17	18.75	78.56	45.29	514.64	155.05	365.33	15.75	42.84	72.41	484.81
modeltype:cass_type	1	20.97	224.39	0.02	68.72	0.01	0.01	0.28	201.68	8.70	53.70	0.10	0.14
modeltype:population_type	1	14.34	37.78	3.29	15.56	87.75	37.01	10.40	41.38	6.51	25.04	83.39	35.33
modeltype:settlement_type	1	225.73	478.49	1.88	5.33	773.81	16.19	158.75	394.75	0.34	17.21	789.56	18.60
modeltype:cass_dist	3	7	795.30	8	1413.08	24.20	21.68	9	857.47	1728.43	1213.44	26.84	23.19
modeltype:cass_summary	6	173.03	320.47	383.73	295.81	18.17	12.15	243.20	372.07	406.50	287.59	15.99	11.04
cass_type:population_type:settlement_type	1	1.37	2.91	2.28	6.96	0.00	0.51	3.02	4.42	2.84	7.26	0.00	0.53
cass_type:cass_dist:cass_summary	1	98.86	73.48	90.83	55.64	4.17	3.46	124.85	65.11	105.70	43.71	3.90	3.50
population_type:population_dist:population_summary	0	94.02	93.23	30.87	64.76	105.46	49.21	65.37	91.07	29.75	56.55	84.78	47.48
modeltype:cass_type:population_type	1	3.26	3.93	8.48	11.81	1.30	2.48	4.77	5.35	10.44	17.06	1.17	2.58
modeltype:cass_type:settlement_type	1	4.27	12.01	3.00	2.99	0.30	2.16	4.26	22.44	1.87	3.21	0.27	1.51
modeltype:population_type:settlement_type	1	0.02	0.09	0.52	0.25	0.43	0.39	0.12	0.06	0.01	0.76	0.43	0.59
modeltype:cass_dist:cass_summary	1	215.68	130.36	479.10	223.54	15.27	10.58	314.42	150.26	488.83	217.40	11.81	10.15
modeltype:cass_type:cass_dist	3	10.53	11.52	41.33	33.56	7.75	3.17	22.42	6.56	61.33	17.02	6.07	3.89
modeltype:cass_type:cass_summary	6	169.88	241.58	86.25	41.16	64.33	53.90	164.40	134.22	119.55	48.25	56.73	53.66
modeltype:population_type:population_dist	3	63.85	52.79	33.16	26.33	405.97	181.27	18.78	17.22	29.98	20.54	351.61	169.83
modeltype:population_type:population_summary	6	151.31	109.19	90.11	267.38	242.67	93.95	80.37	95.18	105.76	354.27	207.20	83.49
modeltype:settlement_type:settlement_dist	2	22.51	11.67	117.89	223.32	736.04	433.76	54.46	44.89	150.33	226.87	817.99	475.67
modeltype:cass_type:population_type:settlement_type	1	0.48	1.03	0.15	0.07	0.26	0.87	0.12	1.03	0.03	0.31	0.23	0.94



	1												
modeltype:cass_type:cass_dist:cass_summary	1	120.11	58.09	101.25	49.54	5.25	4.19	137.48	41.34	113.09	35.75	4.64	3.90
	1												
modeltype:population_type:population_dist:population_summary	0	85.09	43.29	21.16	79.96	104.75	33.57	39.31	39.53	19.34	68.49	72.78	27.48