

Supplementary Information

Use of Landsat multi-temporal imagery to assess secondary growth Miombo woodlands in Luanshya, Zambia

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Appendix S1: Support Vector Machine: Classification error matrices

			Ground Truth ROI Pixels								
		Agricultural areas	Bare land	Built-up areas	Dense woodlands	Grasslands	Paved areas	Riparian vegetation	Water bodies	Total	UA (%)
LULC for 1986	Agricultural areas	-	-	-	-	-	-	-	-	-	-
	Bare land	-	0	3	0	0	0	0	0	115	97
	Built-up areas	-	0	18	0	0	0	0	0	18	100
	Dense woodlands	-	0	0	117	0	0	0	0	117	100
	Grasslands	-	0	0	0	187	0	0	0	187	100
	Paved areas	-	0	0	0	0	148	0	0	148	100
	Riparian vegetation	-	0	0	0	0	0	133	0	133	100
	Water bodies	-	0	0	0	0	0	0	107	107	100
	Total	-	112	21	117	187	148	133	107	825	
	PA (%)	-	100	86	100	100	100	100	100		
	Overall accuracy (%)		99%								
	Kappa coefficient		0.99								
LULC for 1998	Agricultural areas	45	0	0	0	1	1	0	0	47	96
	Bare land	0	181	2	0	0	0	0	0	183	99
	Built-up areas	0	0	96	0	0	0	0	0	96	100
	Dense woodlands	0	0	0	123	0	0	1	0	124	99
	Grasslands	1	0	0	0	118	0	3	0	123	96
	Paved areas	0	1	0	0	0	116	0	0	117	99
	Riparian vegetation	0	0	0	1	0	0	107	0	108	99
	Water bodies	0	0	0	0	0	0	0	110	110	100
	Total	46	182	98	124	119	117	111	110	1009	
	PA (%)	98	100	98	99	99	99	96	100		
	Overall accuracy (%)		99								
	Kappa coefficient		0.99								
LULC for	Agricultural areas	69	0	0	0	3	0	1	0	73	84
	Bare land	0	156	14	0	0	0	0	0	170	92
	Built-up areas	0	0	44	0	0	0	0	0	44	100

	Dense woodlands	0	0	0	119	0	0	0	0	119	99
	Grasslands	0	0	0	0	97	0	0	0	97	100
	Paved areas	0	1	0	0	0	97	0	0	98	98
	Riparian vegetation	0	0	0	0	0	0	107	0	107	98
	Water bodies	0	0	0	0	0	0	0	110	110	100
	Total	69	157	58	119	100	97	108	110	818	
	PA (%)	84	99	76	98	97	96	77	100		
	Overall accuracy (%)		92								
	Kappa coefficient		0.92								
LULC for 2004	Agricultural areas	112	0	0	0	0	6	0	0	118	91
	Bare land	0	159	1	0	0	0	0	0	160	99
	Built-up areas	0	0	97	0	0	0	0	0	97	100
	Dense woodlands	0	0	0	120	0	0	6	0	126	93
	Grasslands	0	0	0	0	105	0	1	0	106	94
	Paved areas	3	0	0	0	0	155	0	0	158	98
	Riparian vegetation	0	0	0	6	0	0	74	0	80	85
	Water bodies	0	0	0	0	0	0	0	110	110	100
	Total	115	159	98	126	105	161	81	110	955	
	PA (%)	93	100	99	94	96	96	78	100		
	Overall accuracy (%)		93								
	Kappa coefficient		0.93								
LULC for 2011	Agricultural areas	113	0	0	0	2	0	0	0	115	98
	Bare land	0	113	5	0	0	0	0	0	118	96
	Built-up areas	0	0	64	0	0	4	0	0	68	60
	Dense woodlands	0	0	0	113	0	0	0	0	113	94
	Grasslands	1	0	0	0	107	0	0	0	108	99
	Paved areas	0	0	0	0	0	134	0	0	134	97
	Riparian vegetation	0	0	0	0	0	0	127	0	127	100
	Water bodies	0	0	0	0	0	0	0	110	110	100
	Total	114	113	69	113	109	138	127	110	893	
	PA (%)	99	99	50	94	98	97	100	100		
	Overall accuracy (%)		90								
	Kappa coefficient		0.88								
LULC	Agricultural areas	109	8	4	0	20	1	0	0	142	77
	Bare land	0	53	21	0	0	0	0	0	74	72

	Built-up areas	0	17	57	0	0	4	0	0	78	73
	Dense woodlands	0	0	0	112	1	0	1	0	114	98
	Grasslands	4	1	0	8	87	0	0	0	100	87
	Paved areas	1	35	44	0	0	133	0	0	213	62
	Riparian vegetation	0	0	1	0	1	0	126	0	128	98
	Water bodies	0	0	0	0	0	0	0	110	110	100
	Total	114	114	127	120	109	138	127	110	959	
	PA (%)	96	47	45	93	80	96	99	100		
	Overall accuracy (%)		82								
	Kappa coefficient		0.8								

Where UA is user accuracy and PA is producer accuracy