

Table S1. Land use and land cover changes in Xinjiang (in km²).

1990 2000	Farmland	Forest	Grassland	Water	Built-up	Unused	Total
Farmland	47692.69	718.58	7914.53	96.03	818.35	2102.21	59342.40
Forest	702.38	30214.18	6021.16	137.20	36.53	1045.28	38156.72
Grassland	5565.64	4118.95	446961.17	1054.83	139.58	21782.55	479622.73
Water	289.27	242.88	2262.40	45771.67	17.02	3871.17	52454.40
Built-up	972.75	47.18	244.16	7.55	2973.59	126.24	4371.47
Unused	1547.22	566.00	21563.05	2547.33	129.99	979809.82	1006163.41
Total	56769.96	35907.76	484966.47	49614.62	4115.06	1008737.27	
R	0.91%	1.25%	-0.22%	1.14%	1.25%	-0.05%	
2000 2010	Farmland	Forest	Grassland	Water	Built-up	Unused	Total
Farmland	58716.40	565.76	5104.01	48.06	4.24	2098.53	66537.00
Forest	4.84	37501.64	69.41	10.27	0.90	167.47	37754.53
Grassland	303.38	48.53	473803.94	253.45	2.37	370.37	474782.05
Water	33.77	28.28	213.81	51860.74	2.16	509.62	52648.37
Built-up	107.80	6.49	62.89	13.76	4358.62	248.82	4798.38
Unused	176.23	6.04	368.82	268.19	3.17	1002768.81	1003591.26
Total	59342.41	38156.75	479622.88	52454.47	4371.47	1006163.61	
R	2.42%	-0.21%	-0.20%	0.07%	1.95%	-0.05%	
2010 2020	Farmland	Forest	Grassland	Water	Built-up	Unused	Total
Farmland	65665.07	218.29	1812.18	63.23	80.49	1190.11	69029.38
Forest	61.76	36674.58	622.07	26.06	4.17	115.95	37504.59
Grassland	516.08	731.85	471174.22	405.25	12.08	1035.73	473875.20
Water	43.84	36.81	186.71	51824.65	8.27	279.57	52379.86
Built-up	121.13	5.65	38.06	1.85	4685.99	135.37	4988.05
Unused	129.13	87.33	948.69	327.26	7.38	1000834.31	1002334.09
Total	66537.00	37754.50	474781.94	52648.30	4798.38	1003591.04	
R	0.75%	-0.13%	-0.04%	-0.10%	0.79%	-0.03%	

Table S2. Land use and land cover changes in the Tarim River region (in km²).

1990 2000	Farmland	Forest	Grassland	Water	Built-up	Unused	Total
Farmland	1727.51	31.45	575.62	4.40	20.48	115.62	2475.09
Forest	36.84	2787.91	1846.96	34.41	1.79	371.04	5078.93
Grassland	119.97	277.22	16930.20	45.79	6.93	645.88	18026.00
Water	9.90	49.57	227.50	679.22	0.18	29.26	995.62
Built-up	14.98	0.22	4.92	0.03	51.16	0.33	71.65
Unused	23.84	76.87	2107.67	57.80	0.88	12028.89	14295.95
Total	1933.05	3223.23	21692.87	821.65	81.42	13191.02	
R	5.61%	11.51%	-3.38%	4.23%	-2.40%	1.68%	
2000 2010	Farmland	Forest	Grassland	Water	Built-up	Unused	Total
Farmland	2463.50	303.31	598.03	16.20	0.17	117.89	3499.09
Forest	0.00	4753.06	6.74	0.21	0.00	38.75	4798.75
Grassland	3.74	15.83	17393.63	78.99	0.00	48.59	17540.78
Water	0.04	3.99	25.44	898.02	0.00	53.14	980.63
Built-up	7.81	0.00	1.06	0.00	71.48	0.01	80.36
Unused	0.00	2.75	1.11	2.20	0.00	14037.57	14043.62
Total	2475.09	5078.93	18026.00	995.62	71.65	14295.95	
R	8.27%	-1.10%	-0.54%	-0.30%	2.43%	-0.35%	
2010 2020	Farmland	Forest	Grassland	Water	Built-up	Unused	Total
Farmland	3414.19	119.57	153.95	17.62	2.72	36.44	3744.49
Forest	17.02	4580.52	44.86	6.74	0.35	26.63	4676.11
Grassland	55.67	71.06	17236.20	100.08	0.22	80.16	17543.38
Water	2.62	8.53	7.25	832.53	0.05	4.74	855.71
Built-up	3.97	0.13	0.60	0.03	77.00	0.04	81.76
Unused	5.63	18.94	97.94	23.64	0.03	13895.62	14041.79
Total	3499.09	4798.75	17540.78	980.63	80.36	14043.62	
R	1.40%	-0.51%	0.00%	-2.55%	0.35%	0.00%	