Table S1. Values of decision variables under different scenarios for sub-regions in Xinjiang

Regions	Scenario	Decision variable	2020	2030	2040	2050
Yili Basin	Scenario 1	Rural domestic water quota (L/(person*day))	105	105	105	105
		Water consumption per industrial output value of ten thousand Yuan (m3)	70	70	70	70
		Irrigation water quota (m3/ hectare)	7500	7500	7500	7500
		Urbanization rate	0.400	0.450	0.510	0.570
		Crop planting area growth rate	0.030	0.020	0.010	0.005
		Industrial output value growth rate	0.040	0.030	0.020	0.010
		Ecological water consumption growth rate	0.940	2.550	3.820	4.700
	Scenario 2	Rural domestic water quota (L/(person*day))	105	105	105	105
		Water consumption per industrial output value of ten thousand Yuan (m3)	70	70	70	70
		Irrigation water quota (m3/ hectare)	7500	7500	7500	7500
		Urbanization rate	0.480	0.540	0.612	0.684
		Crop planting area growth rate	0.042	0.028	0.014	0.007
		Industrial output value growth rate	0.056	0.042	0.028	0.014
		Ecological water consumption growth rate	0.940	2.550	3.820	4.700
	Scenario 3	Rural domestic water quota (L/(person*day))	105	105	105	105
		Water consumption per industrial output value of ten thousand Yuan (m3)	70	70	70	70
		Irrigation water quota (m3/ hectare)	7500	7500	7500	7500
		Urbanization rate	0.400	0.450	0.510	0.570
		Crop planting area growth rate	0.030	0.020	0.010	0.005
		Industrial output value growth rate	0.040	0.030	0.020	0.010
		Ecological water consumption growth rate	2.640	3.250	5.710	5.980
	Scenario 4	Rural domestic water quota (L/(person*day))	105	95	85	75
		Water consumption per industrial output value of ten thousand Yuan (m3)	70	67	60	54
		Irrigation water quota (m3/ hectare)	7500	7000	6000	5000
		Urbanization rate	0.420	0.473	0.536	0.599
		Crop planting area growth rate	0.032	0.021	0.011	0.005
		Industrial output value growth rate	0.042	0.032	0.021	0.011
		Ecological water consumption growth rate	2.120	2.790	4.950	5.050
Junggar Basin	Scenario 1	Rural domestic water quota (L/(person*day))	105	105	105	105
		Water consumption per industrial output value of ten thousand Yuan (m3)	30	30	30	30
		Irrigation water quota (m3/ hectare)	6000	6000	6000	6000
		Urbanization rate	0.750	0.820	0.860	0.890
		Crop planting area growth rate	0.040	0.030	0.010	0.005
		Industrial output value growth rate	0.030	0.020	0.010	0.001
		Ecological water consumption growth rate	0.070	0.060	0.030	0.010
	Scenario 2	Rural domestic water quota (L/(person*day))	105	105	105	105
		Water consumption per industrial output value of ten thousand Yuan (m3)	30	30	30	30
		Irrigation water quota (m3/ hectare)	6000	6000	6000	6000
		Urbanization rate	0.770	0.844	0.878	0.895
		Crop planting area growth rate	0.056	0.042	0.014	0.007
		Industrial output value growth rate	0.042	0.028	0.014	0.001
		Ecological water consumption growth rate	0.070	0.060	0.030	0.010
	Scenario 3	Rural domestic water quota (L/(person*day))	105	105	105	105
		Water consumption per industrial output value of ten thousand Yuan (m3)	30	30	30	30
		Irrigation water quota (m3/ hectare)	6000	6000	6000	6000
		Urbanization rate	0.750	0.820	0.860	0.890
		Crop planting area growth rate	0.040	0.030	0.010	0.005
		Industrial output value growth rate	0.030	0.020	0.010	0.001
		Ecological water consumption growth rate	0.220	0.280	0.340	0.380
	Scenario 4	Rural domestic water quota (L/(person*day))	105	95	85	75

		Water consumption per industrial output value of ten thousand Yuan (m3)	29	26	23	21
		Irrigation water quota (m3/ hectare)	6200	6000	5500	5000
		Urbanization rate	0.788	0.861	0.903	0.935
		Crop planting area growth rate	0.042	0.032	0.011	0.005
		Industrial output value growth rate	0.032	0.021	0.011	0.001
		Ecological water consumption growth rate	0.120	0.190	0.250	0.310
Turpan-Hami Basin	Scenario 1	Rural domestic water quota (L/(person*day))	130	130	130	130
		Water consumption per industrial output value of ten thousand Yuan (m3)	50	50	50	50
		Irrigation water quota (m3/ hectare)	11000	11000	11000	11000
		Urbanization rate	0.800	0.820	0.840	0.850
		Crop planting area growth rate	0.010	0.020	0.020	0.030
		Industrial output value growth rate	0.020	0.023	0.041	0.059
		Ecological water consumption growth rate	0.200	0.100	0.050	0.020
	Scenario 2	Rural domestic water quota (L/(person*day))	130	130	130	130
		Water consumption per industrial output value of ten thousand Yuan (m3)	50	50	50	50
		Irrigation water quota (m3/ hectare)	11000	11000	11000	11000
		Urbanization rate	0.830	0.844	0.856	0.873
		Crop planting area growth rate	0.014	0.028	0.028	0.042
		Industrial output value growth rate	0.028	0.032	0.057	0.083
		Ecological water consumption growth rate	0.200	0.100	0.050	0.020
	Scenario 3	Rural domestic water quota (L/(person*day))	130	130	130	130
		Water consumption per industrial output value of ten thousand Yuan (m3)	50	50	50	50
		Irrigation water quota (m3/ hectare)	11000	11000	11000	11000
		Urbanization rate	0.800	0.820	0.840	0.850
		Crop planting area growth rate	0.010	0.020	0.020	0.030
		Industrial output value growth rate	0.020	0.023	0.041	0.059
		Ecological water consumption growth rate	0.520	0.180	0.110	0.080
	Scenario 4	Rural domestic water quota (L/(person*day))	130	130	120	110
		Water consumption per industrial output value of ten thousand Yuan (m3)	50	50	48	43
		Irrigation water quota (m3/ hectare)	10000	7000	6000	5000
		Urbanization rate	0.840	0.861	0.882	0.893
		Crop planting area growth rate	0.011	0.021	0.021	0.032
		Industrial output value growth rate	0.021	0.024	0.043	0.062
		Ecological water consumption growth rate	0.420	0.150	0.080	0.050
Tarim Basin	Scenario 1	Rural domestic water quota (L/(person*day))	65	65	65	65
		Water consumption per industrial output value of ten thousand Yuan (m3)	50	50	50	50
		Irrigation water quota (m3/ hectare)	10000	10000	10000	10000
		Urbanization rate	0.380	0.430	0.490	0.540
		Crop planting area growth rate	0.033	0.020	0.010	0.005
		Industrial output value growth rate	0.030	0.020	0.010	0.005
		Ecological water consumption growth rate	0.200	0.100	0.040	0.020
	Scenario 2	Rural domestic water quota (L/(person*day))	65	65	65	65
		Water consumption per industrial output value of ten thousand Yuan (m3)	50	50	50	50
		Irrigation water quota (m3/ hectare)	10000	10000	10000	10000
		Urbanization rate	0.456	0.516	0.588	0.648
		Crop planting area growth rate	0.046	0.028	0.014	0.007
		Industrial output value growth rate	0.042	0.028	0.014	0.007
		Ecological water consumption growth rate	0.200	0.100	0.040	0.020
	Scenario 3	Rural domestic water quota (L/(person*day))	65	65	65	65
		Water consumption per industrial output value of ten thousand Yuan (m3)	50	50	50	50
		Irrigation water quota (m3/ hectare)	10000	10000	10000	10000
		Urbanization rate	0.380	0.430	0.490	0.540
		Crop planting area growth rate	0.033	0.020	0.010	0.005

	Industrial output value growth rate	0.030	0.020	0.010	0.005
	Ecological water consumption growth rate	0.320	0.180	0.075	0.033
Scenario 4	Rural domestic water quota (L/(person*day))	65	60	55	50
	Water consumption per industrial output value of ten thousand Yuan (m3)	50	49	45	40
	Irrigation water quota (m3/ hectare)	9600	8000	6300	5000
	Urbanization rate	0.399	0.452	0.515	0.567
	Crop planting area growth rate	0.035	0.021	0.011	0.005
	Industrial output value growth rate	0.032	0.021	0.011	0.006
	Ecological water consumption growth rate	0.290	0.163	0.067	0.029