

APPENDIX 1
SUPPLEMENTARY TABLES FROM CHAPTER 3

Table A1.1: Characteristics of Major Lakes

| Name of Lake | Outflow/Rivers in Basin | Drainage Basin (km ²) | Surface Area (km ²) | Altitude (m) | Average Depth (m) | Maximum Depth (m) | Volume (km ³) | Salinity | Average Length (km) | Average Width (km) | Maximum Width (km) |
|--------------|--|-----------------------------------|---------------------------------|--------------|-------------------|-------------------|---------------------------|----------|---------------------|--------------------|--------------------|
| Karakul | No drainage (Rivers in basin, however, include Karajilga, Karaart, and Muzkol) | 4,150 | 380.00 | 3,914 | 112.0 | 238 | 26.5 | Very | 32.0 | 11.9 | 23.2 |
| Sarez | Murgab | 16,500 | 86.50 | 3,239 | 190.0 | 505 | 17.3 | None | 55.8 | 1.44 | 3.3 |
| Zorkul | Pamir (Also in basin Karajilga, Mukurilov, Akzau, other unnamed streams) | 1,080 | 38.90 | 4,126 | 2.6 | | | | 20.0 | 1.95 | 4.0 |
| Yashilkul | Gunt (Alichur also in basin) | 5,280 | 36.10 | 3,734 | | 50 | | | 24.2 | 1.5 | 3.7 |
| Shorkul | Outflow joins a tributary of Lake Rangkul | 2,410 | | 3,780 | | | | Moderate | | | |
| Chakahkul | | 721 | 9.20 | 4,126 | | | | Moderate | | | |
| Gurmantaikul | | 49 | 8.90 | 4,213 | | | | Moderate | | | |
| Sassasakul | | 4 | 8.00 | 4,213 | | | | Moderate | 3.5 | 2.0 | |
| Rangkul | Unites with Lake Shorkul (outflow to Uzyukdarya River) | 1,890 | 7.78 | 3,782 | 1.5 | | | None | | | |
| Kukjigit | | | 5.00 | 4,262 | 4.5 | | | Moderate | 3.0 | 2.0 | |
| Karadung | | | 2.00 | | 0.5 | | | Moderate | 2.0 | 1.5 | |
| Zaroshkul | | 77.5 | 5.50 | 4,518 | | | | Moderate | | | |
| Bulunkul | | 535 | 3.40 | 3,757 | | | | Moderate | | | |
| Chatyrkul | | | 1.75 | | | | | Moderate | | | |
| Iskandarkul | Outflow to Isfara River | 76 | 3.40 | 2,195 | | 72 | | None | | | |
| Chapdara | | 24 | 3.20 | 4,529 | | | | | | | |
| Salangur | | 90.3 | 2.40 | 4,172 | | | | | | | |
| Shoduvkul | | 80 | 2.20 | 3,239 | | | | None | | | |
| Akkul | | 32 | 1.90 | 4,485 | | | | None | | | |
| Drumkul | | 278 | 1.50 | 3,335 | | | | None | | | |

Source: Ministry of Environment (Note: Blank cells mean no data available) Water use.

Table A1.2: Characteristics and Uses of Reservoirs

| Name and Location | Source | Total Volume (km ³) | Useable Volume (km ³) | Surface Area (km ²) | Regulation Regime | Types of Uses | Period of Construction | Start of Operation |
|---------------------|----------|---------------------------------|-----------------------------------|---------------------------------|-------------------|---|------------------------|--------------------|
| Farkhad, Leninabad | Syrdarya | 0.330 | no data | 46.00 | Daily | Irrigation, energy, recreation, water supply | 1942-1948 | 1948 |
| Kairakum, Leninabad | Syrdarya | 4.160 | 2.600 | 520.00 | Seasonal | Irrigation, energy, recreation | 1952-1956 | 1965 |
| Katasai, Leninabade | Katasai | 0.055 | 0.036 | 2.90 | Seasonal | Irrigation, recreation, water supply, flood control | 1958-1966 | 1965 |
| Nurek, Khatlon | Vaksh | 10.500 | 4.500 | 98.00 | Seasonal | Irrigation, energy, recreation, water supply | 1961-1980 | 1980 |
| Golova, Khatlon | Vaksh | 0.095 | 0.020 | 7.50 | Daily | Irrigation, energy, water supply, recreation | 1956-1962 | 1962 |
| Muminabad, Khatlon | Obisurkh | 0.031 | 0.030 | 2.85 | Seasonal | Irrigation, water supply, recreation | 1958-1959 | 1959 |
| Selbur, Khatlon | Kzylsu | 0.020 | 0.017 | 2.30 | Seasonal | Irrigation, water supply, recreation, flood control | 1961-1966 | 1965 |
| Baipazin, Khatlon | Vaksh | 0.125 | 0.087 | 8.04 | Seasonal | Irrigation, energy, water supply, recreation | 1962-1989 | 1989 |
| Daganai, Leninabade | Dagan | 0.028 | 0.014 | 2.81 | Seasonal | Irrigation, water supply, flood control | 1977-1983 | 1985 |

Source: Ministry of Environment.

| | Urban Water Supply | | Industry | | Irrigation | | Rural Water Supply | | Fisheries | | Total | |
|--------------|--------------------|------|----------|------|------------|------|--------------------|------|-----------|------|-------|------|
| | 1990 | 1996 | 1990 | 1996 | 1990 | 1996 | 1990 | 1996 | 1990 | 1996 | 1990 | 1996 |
| Karakhona | | | | | 3 | 2 | | | | | 3 | 2 |
| Maidonsai | 4 | 3 | 1 | 1 | 110 | 71 | 2 | 4 | | | 171 | 79 |
| Ashtsai | | | | | 5 | 5 | | | | | 5 | 5 |
| Shirinsai | 8 | 3 | 1 | 1 | 84 | 71 | 5 | 15 | | | 98 | 90 |
| Katasai | 3 | 1 | 3 | 1 | 102 | 52 | 12 | 5 | | | 120 | 59 |
| Ashabasai | | | | | 14 | 14 | | | | | 14 | 14 |
| Shurbulaksai | | 1 | | | 28 | 31 | 2 | | | | 30 | 32 |
| Utkensai | 3 | 1 | 1 | 1 | | | | | | | 4 | 2 |
| Takmaksai | 1 | 1 | | | | | | | | | 1 | 1 |
| Tolsai | 1 | 1 | | | | | | | | | 1 | 1 |
| Bigulsai | | | | | 1 | | | | | | 1 | |

Source: Ministry of Environment (Note: Shaded cells in each column add up to total use for republic).

Table A1.4: Groundwater Use by Raions within the Basins

| <i>Raion</i> | Confirmed Untouched Reserves | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | Discarded | |
|---------------------------|------------------------------|--------------|---|-----------------------|---|-----------------|---|-------------------|---|-----------------------------|---|-------------------------------|---|-----------|-------|
| Syrdarya Basin | | Total | | Drinking Water | | Industry | | Irrigation | | Rural Drinking Water | | Irrigation Of Pastures | | | |
| Matcha | 334.40 | 280 | 541.95 | 55 | 113.81 | 15 | 12.48 | 110 | 221.16 | 98 | 192.50 | 2 | 2 | | |
| Khujand | 1,257.00 | 729 | 1,332.39 | 212 | 469.45 | 68 | 202.03 | 308 | 520.41 | 140 | 138.50 | 1 | 2 | | |
| Asht | 330.10 | 804 | 786.46 | 68 | 98.33 | 1 | 2.00 | 407 | 400.83 | 328 | 285.30 | | | | |
| Zafarabad | | 310 | 438.80 | 66 | 78.26 | | | 244 | 360.54 | | | | | | |
| Nau | 38.2 | 242 | 216.81 | 70 | 50.26 | 38 | 18.00 | 85 | 110.86 | 49 | 37.69 | | | | |
| Proletarian | 432.00 | 253 | 405.25 | 17 | 45.46 | 2 | 4.39 | 128 | 216.04 | 106 | 139.36 | | | | |
| Kanibadam | 490.00 | 294 | 296.11 | 57 | 71.25 | 63 | 50.84 | 101 | 91.04 | 73 | 82.98 | | | | |
| Isfara | 216.80 | 152 | 240.74 | 33 | 72.10 | 19 | 39.52 | 56 | 63.28 | 44 | 65.84 | | | | |
| Ura-Tyube | 174.60 | 348 | 168.28 | 74 | 56.30 | 16 | 9.82 | 139 | 84.16 | 14 | 14.00 | 5 | 4 | | |
| Ganchi | 79.20 | 171 | 198.83 | 58 | 71.13 | | | 111 | 121.70 | | | 2 | 6 | | |
| Zeravshan Basin | | | | | | | | | | | | | | | |
| Penjkent | 85.40 | 38 | 48.53 | 33 | 38.09 | 3 | 8.44 | 2 | 2.00 | | | | | | |
| Aini | | 5 | 4.23 | 1 | 0.46 | 1 | 0.99 | 3 | 2.78 | | | | | | |
| Total In Leninabad Oblast | 3,437.70 | 3,526 | 4,678.38 | 744 | 1,164.90 | 226 | 348.51 | 1,694 | 2,194.80 | 252 | 956.17 | 10 | 14 | | |
| Surkhandarya Basin | | | | | | | | | | | | | | | |
| Tursunzade | 225.30 | 96 | 145.08 | 61 | 80.44 | 12 | 39.40 | 12 | 16.80 | 4 | 0.90 | | | 7 | 2.54 |
| Gissar | | 16 | 17.15 | 16 | 17.15 | | | | | | | | | | |
| Kafarnigan Basin | | | | | | | | | | | | | | | |
| Gissar | 76.90 | 80 | 77.12 | 51 | 33.88 | 8 | 3.61 | 21 | 37.06 | | | | | 2 | 2.57 |
| Asht | 122.54 | 104 | 84.00 | 96 | 65.15 | 7 | 16.45 | 1 | 2.40 | | | | | | |
| Dushanbe | 789.97 | 133 | 379.50 | 72 | 308.24 | 55 | 69.86 | 6 | 1.40 | | | | | | |
| Kafarnigan | 280.51 | 108 | 136.27 | 84 | 122.62 | 20 | | | | | | | | 4 | 0.80 |
| Shartuz | 67.40 | 34 | 22.54 | 32 | 22.34 | 2 | 0.20 | | | | | | | | |
| Faizabad | 108.67 | 63 | 45.00 | 26 | 21.85 | | | 8 | 9.80 | | | | | 29 | 13.35 |
| Kabadion | 16.20 | 27 | 10.13 | 27 | 10.13 | | | | | | | | | | |

| <i>Raion</i> | Confirmed Untouched Reserves | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | No. of Wells | Total Withdrawal ('000 m ³ /day) | Discarded | |
|----------------------|------------------------------|--------------|---|----------------|---|--------------|---|--------------|---|----------------------|---|------------------------|---|-----------|--------|
| | | Total | | Drinking Water | | Industry | | Irrigation | | Rural Drinking Water | | Irrigation Of Pastures | | | |
| Vaksh Basin | | | | | | | | | | | | | | | |
| Faizabad | 22.10 | 27 | 23.06 | 5 | 1.81 | 4 | 6.4 | 8 | 8.2 | 3 | 4.20 | | | 7 | 2.45 |
| Darband | | 1 | 1.63 | 1 | 1.60 | | | | | | | | | | |
| Gissar | | 17 | 16.34 | 12 | 13.04 | 2 | 0.9 | 3 | 2.4 | | | | | | |
| Djargatal | 9.20 | 2 | 2.67 | 2 | 2.67 | | | | | | | | | | |
| Gozimalik | | 11 | 6.53 | 10 | 5.35 | n/a | | | | | | | | 1 | 0.08 |
| Yavan | | 26 | 14.30 | | | | | | | | | | | 26 | 14.30 |
| Khadjamastan | 24.12 | 47 | 20.41 | 40 | 22.45 | 3 | 1.40 | 3 | 4.15 | | | | | 8 | 1.41 |
| Bokhtar | 223.70 | 70 | 62.21 | 47 | 28.86 | 13 | 10.15 | 2 | 3.00 | | | | | 8 | 20.20 |
| Vaksh | | 10 | 5.95 | 8 | 4.95 | | | 2 | 1.00 | | | | | | |
| Kolkhozabad | | 36 | 60.99 | 4 | 3.20 | 2 | 0.29 | | | | | | | 30 | 57.50 |
| Djilikul | | 23 | 33.79 | 3 | 0.69 | | | | | | | | | 20 | 33.10 |
| Kumsangir | | 9 | 15.60 | | | | | | | | | | | | |
| Kzylsu Basin | | | | | | | | | | | | | | | |
| Pyanj | | 41 | 23.60 | 40 | 22.70 | | | 1 | 0.90 | | | | | | |
| Dangarin | | 20 | 9.44 | 13 | 8.73 | 1 | 0.01 | 2 | 0.03 | | | | | 4 | 0.58 |
| Sovetski | 12.96 | 8 | 4.63 | 8 | 4.63 | | | | | | | | | | |
| Khobaling | 27.30 | 50 | 62.18 | 14 | 7.48 | | | 30 | 48.10 | | | | | 6 | 6.60 |
| Leningrad | 33.00 | 43 | 12.44 | 23 | 10.22 | | | | | | | | | 20 | 2.22 |
| Kulyab | 461.40 | 119 | 116.55 | 49 | 59.88 | 5 | 1.78 | 47 | 34.93 | | | | | 18 | 19.96 |
| Voce | 63.20 | 242 | 323.83 | 71 | 68.24 | 7 | 2.20 | 140 | 220.47 | | | | | 24 | 32.92 |
| Moskow | 146.80 | 53 | 24.98 | 44 | 22.18 | 7 | 2.60 | | | | | | | 2 | 0.20 |
| Parkhar | 119.40 | 47 | 23.10 | 43 | 21.48 | 4 | 1.62 | | | | | | | | |
| Pyanj Basin (GBAO) | 98.10 | 5 | 3.34 | 5 | 3.34 | | | | | | | | | | |
| Southwest Tajikistan | 3,015.81 | 1,568 | 1,793.36 | 907 | 995.30 | 150 | 170.91 | 286 | 389.67 | 7 | 5.10 | | | 218 | 232.38 |
| Tajikistan Total | 6,453.50 | 5,094 | 6,471.74 | 16,511 | 2,160.20 | 376 | 519.42 | 1,980 | 2,584.47 | 859 | 961.27 | 10 | 14 | 218 | 232.38 |

Source: Ministry of Environment (Note: Blank cells indicate not applicable).

Table A1.5: Centralized Water Supply

| Location of Water Treatment Plant | Capacity ('000 m ³ /day) | | Year Constructed | Condition |
|-----------------------------------|-------------------------------------|--------|------------------|--------------------------|
| | Design | Actual | | |
| Varzob, Dushanbe | 16 | 16 | 1934 | Unsatisfactory |
| Dushanbe | 100 | 100 | 1957-1970 | Unsatisfactory |
| Kafernigan, Dushanbe | 170 | 166 | 1974 | No data |
| Southwest, Dushanbe | 162 | 160 | 1974 | Unsatisfactory |
| Station #1, Kurgan Tyube | 8.6 | 8.6 | 1956 | Needs capital investment |
| Station #3, Kurgan Tyube | 2.8 | 2.8 | 1989 | Needs capital investment |
| Station #14, Bokhtar | 58 | 58 | 1964 | Needs capital investment |
| Station #12 | 3 | 3 | 1976 | Needs capital investment |
| Vaksh | 6 | 5 | 1962 | Unsatisfactory |
| Khodjamaston | 6 | 3 | 1960 | Needs capital investment |
| Pyanj | 7.2 | 5.9 | 1976 | Unsatisfactory |
| Kulyab | 80 | 26.3 | 1939-1940 | Satisfactory |
| Shaartuz | 20.7 | 20.1 | No data | Satisfactory |
| Dusti | 23.2 | 9.2 | No data | Satisfactory |
| Leningrad | 3.5 | 3.3 | No data | Satisfactory |
| Voce | 16.5 | 10.3 | No data | Unsatisfactory |
| Moskow | 11.5 | 11 | No data | Satisfactory |
| Parkhor | 42.5 | 9.8 | No data | Satisfactory |
| Dangara | 3.9 | 3.9 | No data | Satisfactory |
| Faisabad | 8 | 4.5 | No data | Satisfactory |
| Garm | 10 | 8 | No data | Satisfactory |
| Djirgatol | No data | 2.1 | No data | Satisfactory |
| Tursunzade | 11.9 | 11.8 | No data | Satisfactory |
| Somoniyon | 26.2 | 11.9 | No data | Satisfactory |
| Murgab | 0.9 | 0.9 | 1980 | Satisfactory |
| Rushon | 0.77 | 0.7 | 1968 | Satisfactory |
| Vanch | 0.8 | 0.8 | 1968 | Satisfactory |
| Darvoz | 0.7 | 0.7 | 1970 | Satisfactory |
| Khorog | 10.2 | 10.2 | 1970 | Satisfactory |
| Khujand | 175 | 170.8 | No data | Satisfactory |
| Gafurov | 28.8 | 12.6 | No data | Satisfactory |
| Proletariat | 10.8 | 7.3 | No data | Satisfactory |
| Nau | 13 | 12.9 | No data | Satisfactory |
| Kairakum | 14.6 | 10 | No data | Satisfactory |
| Kanibadam | 34.9 | 30 | No data | Satisfactory |
| Isfara | 23.8 | 20.3 | No data | Unsatisfactory |
| Matcha | 18.8 | 6.8 | No data | Unsatisfactory |
| Zafarobod | 24.3 | 19.8 | No data | Unsatisfactory |
| Uratyube | 28.8 | 27.2 | No data | Unsatisfactory |
| Gonchi | 3.5 | 3.1 | No data | Unsatisfactory |
| Pyanjakent | 20.7 | 8.5 | No data | Satisfactory |
| Aini | 2.2 | 2 | No data | Satisfactory |

Table A1.6: Protected Areas¹

| Name | Size (‘000 ha) | Comments |
|------------------------------------|--------------------------|---|
| Zapavednik (Nature Reserve) | | |
| Tigrovaya Balka | 49.8 | Includes inundated tugai forests in the lower reaches of the Vaksh and Pyanj rivers and is the largest protected area in Central Asia of poplars |
| Dashtijum | Not available | Located on the Pyanj river, it was established to protect pistachio, juniper, maple, shrubs, pomegranate, fig and herb vegetation. A complete inventory of the flora and fauna has not yet been carried out |
| Romit | 16.1 | Located in the lower reaches of the Sarbo and Sardai Migna rivers in Central Tajikistan. Established for the protection of mountain coniferous, broad-leaved and nuciferous forests, and headwaters, semi-savanna tall grass, sub-alpine grasslands, and meadow-steppe ecosystems |
| Zakazniks (Nature Refuges) | | |
| Muzkulsky | 68.0 | Located between the Zaalaisky and Muzkulsky mountain ranges of the Pamirs to protect alpine grasslands and several protected mammals |
| Pamirsky | 500.0 | Located around the largest lake, Karakul. Established to protect unique ecosystem of Karakul |
| Sanglyarsky | 51.0 | Located on the Peter the First mountain range to protect nuciferous and juniper forests, mammals and migrating birds |
| Komarou | 9.0 | Located on the southern slope of the Karategin ridge. Protects the Komarou river (a tributary of the Surkhob) which is a breeding ground of the Amudarya trout |
| Sarykhosorsky | 40.0 | Protects nuciferous forests including groves of English walnuts, wild apples, pears, haw-apples, grapes, pistachios, junipers and maples |
| Childukhtaronsky | 12.6 | Located in the south of the republic and protects mixed mountain forest and rock formations |
| Karatausky (Vakhshsky) | 14.2 | Located in the south along the slopes of the Karatau ridge along the Pyanj river. Protects pistachio thickets |
| Dashtimaidonsky | 10.1 | Northern slope of Vaksh ridge along west bank of Vaksh river. Protects mixed mountain forests, including thickets of pistachio. Bukhara red deer had been reintroduced |
| Iskandarkulski | 28.5 | Located on the northern slope of the Gissar ridge. Established to protect the aquatic ecosystem of Isandarkul lake and surrounding juniper, poplars, Turkestanic birch, thickets of briar, black barberry, and red currant |
| Saivatinsky | 4.1 | Located in the Zeravshan valley. Established to protect springs that contribute to the headwaters of tributaries of the Zeravshan |
| Zeravshansky (Sarezmsky) | 5.0 | Includes both banks of the Zeravshan river near Penjkent. Established to protect unique tugai thickets including silverberry, sea-buckthorn |
| Kusavlisaisky | 20.0 | Established on northern slope of Turkestan ridge for protection of juniper forests |
| Aktashsky | 15.0 | Established on the southeastern slope of the Kuramin ridge for the protection of juniper and broadleaf arboreal shrubs. Old drifts which house migrating bats are protected |
| National Parks | | |
| Pamirsky | Not available | Established in 1992-3 in Central Tajikistan. Altitudes range from 1,500-5,000 m and includes unique mountain, valley, and riparian ecosystems. Targeted for tourism development |

¹ From *Conserving Biodiversity of Central Asia: Tajikistan*. Ed. Patchadjanov, D.N., S.T. Blagaveschenskaja, O.B. Pereladova. Dushanbe, 1997.

| Name | Size (‘000 ha) | Comments |
|-------------|--------------------------|---|
| Shirkent | 300 | Located on the southern slopes of the Gissar range and protects 30 unique fossil formations. Contains juniper forests and alpine grasslands. Includes the village of Shirkent |
| Zorkylsky | Not available | Recently upgraded and expanded in size from a nature refuge of 16.5 thousand ha. Located on the border with Afghanistan. Established to protect Zorkulskie lakes, steppe and meadow ecosystems, and several protected species |

Source: Ministry of Environment.

Table A1.7: Pollutants by City and Year

| | | Particulates | | NO | | NO ₂ | | SO ₂ | | F | | Formaldehyde | | CO ₂ | | Ammonium | | HF | |
|--------------|------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
| | | mg/m ³ | Portion of MPC | mg/m ³ | Portion of MPC | mg/m ³ | Portion of MPC | mg/m ³ | Portion of MPC | mg/m ³ | Portion of MPC | mg/m ³ | Portion of MPC | mg/m ³ | Portion of MPC | mg/m ³ | Portion of MPC | mg/m ³ | Portion of MPC |
| Dushanbe | 1990 | 0.5 | 3.3 | 0.04 | 0.6 | 0.08 | 2 | 0.01 | 0.2 | | | 0.004 | 1.3 | 4 | 1.3 | | | | |
| | 1991 | 0.5 | 3.3 | 0.04 | 0.6 | 0.06 | 1.5 | 0.01 | 0.2 | | | 0.004 | 1.3 | 4 | 1.3 | | | | |
| | 1992 | 0.4 | 2.7 | 0.03 | 0.5 | 0.04 | 1 | 0.008 | 0.16 | | | 0.004 | 1.3 | 3 | 1 | | | | |
| | 1993 | 0.38 | 2.5 | 0.03 | 0.5 | 0.04 | 1 | 0.009 | 0.18 | | | 0.004 | 1.3 | 2.5 | 0.8 | | | | |
| | 1994 | 0.3 | 2.0 | | | 0.03 | 0.75 | 0.007 | 0.14 | | | 0.002 | 0.7 | 2.1 | 0.7 | | | | |
| | 1995 | 0.4 | 2.7 | 0.02 | 0.3 | 0.03 | 0.75 | 0.007 | 0.14 | | | | | 3 | 1 | | | | |
| | 1996 | | | | | 0.03 | 0.75 | 0.007 | 0.14 | | | 0.003 | 1 | | | | | | |
| | 1997 | | | | | 0.03 | 0.75 | 0.008 | 0.16 | | | 0.004 | 1.3 | 4 | 1.3 | | | | |
| | 1998 | | | | | 0.03 | 0.75 | 0.008 | 0.16 | | | 0.003 | 1 | 1 | 0.3 | | | | |
| Khujand | 1990 | 0.1 | 0.7 | 0.01 | 0.16 | 0.04 | 1 | | | | | | | 1 | 0.3 | | | | |
| | 1991 | 0.2 | 1.3 | 0.02 | 0.3 | 0.03 | 0.75 | | | | | | | 1 | 0.3 | | | | |
| | 1992 | 0.3 | 2.0 | 0.02 | 0.3 | 0.03 | 0.75 | 0.005 | 0.1 | | | 0.001 | 0.3 | 1 | 0.3 | | | | |
| | 1993 | 0.2 | 1.3 | 0.02 | 0.3 | 0.03 | 0.75 | 0.005 | 0.1 | | | 0.002 | 0.6 | 1 | 0.3 | | | | |
| | 1994 | 0.3 | 1.3 | 0.03 | 0.5 | 0.02 | 0.5 | 0.004 | 0.08 | | | | | 0.3 | 0.1 | | | | |
| | 1995 | | 2.0 | 0.03 | 0.5 | 0.03 | 0.75 | 0.004 | 0.08 | | | | | 1 | 0.3 | | | | |
| | 1996 | | | | | 0.02 | 0.5 | 0.004 | 0.08 | | | | | 0.3 | 0.1 | | | | |
| Kurgan Tyube | 1990 | 0.4 | 2.7 | 0.09 | 1.5 | 0.06 | 1.5 | 0.01 | 0.2 | | | | | 1 | 0.3 | 0.05 | 0.25 | | |
| | 1991 | 0.4 | 2.7 | 0.09 | 1.5 | 0.06 | 1.25 | 0.009 | 0.18 | | | | | 1 | 0.3 | 0.05 | 0.25 | | |
| | 1992 | 0.4 | 2.7 | 0.08 | 1.3 | 0.05 | 1.25 | 0.016 | 0.32 | | | 0 | | 1 | 0.3 | 0.06 | 0.3 | | |
| | 1993 | | | | | 0.07 | 1.75 | 0.01 | 0.2 | | | 14 | 4 | 1 | 0.3 | 0.12 | 0.6 | | |
| | 1994 | | | | | 0.05 | 1.25 | 0.02 | 0.4 | | | | | 1 | 0.3 | 0.04 | 0.2 | | |
| | 1995 | | | | | 0.05 | 1.25 | 0.026 | 0.52 | | | | | 1 | 0.3 | 0.04 | 0.2 | | |
| | 1996 | | | | | 0.06 | 1.5 | 0.027 | 0.54 | | | | | 1 | 0.3 | 0.05 | 0.25 | | |
| | 1997 | | | | | 0.06 | 1.5 | 0.026 | 0.52 | | | | | 1 | 0.3 | 0.05 | 0.25 | | |
| | 1998 | | | | | 0.06 | 1.5 | 0.025 | 0.5 | | | | | | | 0.06 | 0.3 | | |
| Kulyab | 1990 | 0.4 | 2.7 | | | 0.06 | 1.5 | 0.01 | 0.2 | | | | | 1 | 0.3 | 0.05 | 0.25 | | |
| | 1991 | 0.2 | 1.3 | | | 0.06 | 1.5 | 0.01 | 0.2 | | | | | | | | | | |
| | 1992 | 0.1 | 0.7 | | | 0.06 | 1.5 | 0.009 | 0.18 | | | | | | | | | | |
| Tursunzade | 1990 | 0.2 | 1.3 | 0.01 | 0.16 | 0.02 | 0.5 | | | 0.01 | 0.3 | | | 1 | 0.3 | | | 0.003 | 0.6 |
| | 1991 | 0.2 | 1.3 | 0.01 | 0.16 | 0.03 | 0.75 | | | 0.01 | 0.3 | | | 2 | 0.6 | | | 0.003 | 0.6 |

Source: Ministry of Environment (Note: blank cells indicate that no relevant data were available).

CO₂ = carbon dioxide; F = fluorine; HF = hydrogen fluoride; MPC = maximum permissible concentration; mg/m³ = milligram per cubic meter; NO = nitric oxide; NO₂ = nitrogen dioxide; SO₂ = sulfur dioxide.

Table A1.8: Sewage Systems and Wastewater Treatment, 1998

| Location of Water Treatment Facility | Capacity ('000 m ³ /day) | | Year Constructed | Condition |
|--|-------------------------------------|---------|------------------|----------------------------|
| | Design | Actual | | |
| Kurgan Tyube—new system | 24.0 | 11.40 | 1983 | Needs capital investment |
| Kurgan Tyube—old system | 6.0 | 6.00 | 1963 | Needs capital investment |
| Bokhtar | 0.7 | 0.40 | 1986 | Needs repair |
| Khojamaston | 0.7 | 0.30 | 1986 | Needs repair |
| Sarband | 6.0 | 2.00 | 1983 | Needs capital investment |
| Vaksh | 6.0 | 1.00 | 1983 | Satisfactory |
| Kolkhozabad | 2.0 | 1.00 | 1973 | Unsatisfactory |
| Kolkhozabad | 0.7 | 0.10 | 1973 | Satisfactory |
| Kumsangir | 0.7 | 0.28 | 1969 | Unsatisfactory |
| Pyanj | 0.7 | 0.10 | 1983 | Needs capital investment |
| Shaartuz | 2.0 | 1.40 | 1983 | Needs capital investment |
| Khorog | 2.4 | 1.30 | 1976 | Emergency conditions |
| Dushanbe | 294.5 | no data | 1967 | Unsatisfactory |
| Khujand | 65.0 | no data | 1980 | Needs capital investment |
| Kulyab | 20.0 | 12.00 | 1971 | Satisfactory |
| Tursunzade | 33.0 | 20.00 | 1974 | Satisfactory |
| Yavan <i>raion</i> | 26.7 | 19.80 | 1978 | Needs capital investment |
| Kafirnigan | 4.6 | No data | 1972 | Satisfactory |
| Faizabad | 0.4 | 0.10 | 1978 | Satisfactory |
| Gissar | 1.5 | 0.50 | 1989 | Unsatisfactory |
| Lenin <i>Raion</i> | 1.18 | 1.50 | 1989 | Needs reconstruction |
| Gafurov | 0.60 | 0.30 | 1989 | Needs capital investment |
| Nau | 0.76 | No data | 1989 | Needs reconstruction |
| Kairakum | 16.00 | 9.73 | 1989 | Satisfactory |
| Kanibadam | 18.50 | 8.00 | 1989 | Satisfactory |
| Uratyube | 4.80 | No data | 1989 | Satisfactory |
| Chkalovsk | 24.40 | 12.00 | 1989 | Satisfactory |
| Housing Construction Plant, Kulyab | 0.20 | 0 | 1987 | Not functioning since 1995 |
| Amirshokva Central <i>Raion</i> Hospital | 0.20 | 0 | 1986 | Not functioning since 1995 |
| Amirshoeva Dairy Farm | 1.50 | 0 | 1986 | Not functioning since 1994 |
| Amirshoeva Poultry Plant | 1.20 | no data | 1986 | Not functioning since 1994 |
| Dangara | 1.40 | 0.70 | 1979 | Satisfactory |
| Sebiston/Dangara | 0.70 | 0.30 | 1976 | Unsatisfactory |
| Siofark Khovalinsk | 0.20 | no data | 1987 | Not functioning since 1992 |
| Khovaling | 30.00 | no data | 1984 | Not functioning since 1992 |
| Sovietski Central <i>Raion</i> Hospital | 0.20 | no data | 1988 | Not functioning since 1994 |
| Poultry Plant | 0.40 | no data | 1985 | Not functioning since 1993 |
| Lenin Maskovskii Central <i>Raion</i> Hospital | 0.20 | no data | 1987 | Not functioning since 1994 |
| Canning plant (Lenin Voce <i>raion</i>) | 0.20 | no data | 1991 | Not functioning since 1992 |
| Murgab | 14.60 | 0.60 | 1980 | Emergency conditions |
| Chepturin Poultry Plant | 2.60 | 0.40 | 1989 | Unsatisfactory |
| Gambulok Poultry Plant/Faizabad | 5.00 | 0.20 | 1980 | Collapsing-needs repair |

| Location of Water Treatment Facility | Capacity ('000 m ³ /day) | | Year Constructed | Condition |
|--------------------------------------|-------------------------------------|---------|------------------|--------------------------------|
| | Design | Actual | | |
| Kafernigan Poultry Plant | 1.60 | 0.60 | 1973 | Satisfactory |
| Voce Regional Hospital I | 0.20 | 0.20 | 1986 | no data |
| Voce Regional Hospital II | 0.10 | 0.10 | 1985 | Direct release to Yakhsu River |
| Voce Beer Factory | 0.40 | 0.08 | 1982 | Not functioning since 1995 |
| Kulyab Truck Fleet Enterprise | 0.10 | -0.04 | no data | Not functioning since 1994 |
| Kulyab Petroleum Plant | 0.03 | -0.02 | 1986 | Unsatisfactory |
| Voce Petroleum Plant | 0.04 | 0.03 | no data | Not functioning since 1995 |
| Kulyab Aviation Enterprise | 0.23 | 0.23 | no data | Direct release to Karez River |
| Kulyab Oil-producing Plant | 0.03 | 0.03 | no data | Unsatisfactory |
| Khorog Road Construction Department | 0.10 | 0.06 | no data | |
| Khorog Meat Packaging Plant | 0.02 | 0.02 | no data | Unsatisfactory |
| Republic Tuberculosis Hospital I | 0.20 | 0.20 | 1964 | Satisfactory |
| Factory, Kafernigan | 0.40 | No data | 1969 | Satisfactory |
| Kafernigan Livestock Yard | 0.90 | 0.20 | 1976 | Satisfactory |

Source: Ministry of Environment.

Table A1.9: History of Land Use in State-Controlled Land Fund by Year
(Thousands of hectares)

| | Year | Total Land | Cultivated | Of which, irrigated | Perennials | Hay | Pasture | Total Agricultural Land | Forest & Brush | Unused Land |
|-----------|------|------------|------------|---------------------|------------|------|---------|-------------------------|------------------|-------------|
| Oblast | | | | | | | | | | |
| Leninabad | 1960 | 2,810.8 | 255.9 | 106.0 | 26.5 | 2.5 | 735.1 | 1,089.4 | 102.6 | n/d |
| | 1970 | 2,729.0 | 262.5 | 132.7 | 32.0 | 2.1 | 774.2 | 1,112.7 | 97.6 | 1,392.4 |
| | 1985 | 2,723.3 | 279.5 | 183.9 | 41.2 | 2.2 | 788.5 | 1,129.9 | 96.8 | n/d |
| | 1990 | 2,728.5 | 280.9 | 191.6 | 47.7 | 1.2 | 785.3 | 1,129.8 | 105.3 | 1,343.5 |
| | 1998 | 2,663.7 | 256.0 | 175.6 | 53.2 | 1.2 | 816.4 | 1,141.0 | 96.8 | 1,219.9 |
| Khatlon | 1985 | 2,811.6 | 373.6 | 266.4 | 19.8 | 16.0 | 1,213.9 | 1,626.4 | n/d | n/d |
| | 1990 | 2,805.3 | 389.2 | 285.7 | 24.0 | 12.6 | 1,210.8 | 1,638.4 | 222.5 | 753.7 |
| | 1998 | 2,710.9 | 256.0 | 175.6 | 24.6 | 9.9 | 1,197.7 | 1,589.3 | 240.2 | 640.4 |
| RRS | 1960 | 4,867.5 | 471.1 | 200.8 | 23.3 | 32.9 | 1,738.3 | 2,325.0 | 184.8 | n/d |
| | 1970 | 5,281.8 | 495.0 | 269.7 | 28.5 | 24.3 | 1,933.1 | 2,509.1 | 232.1 | 2,305.6 |
| | 1985 | 2,508.7 | 136.4 | 73.6 | 19.3 | 2.7 | 868.4 | 1,026.4 | n/d | n/d |
| | 1990 | 2,509.9 | 131.4 | 74.9 | 24.1 | 3.2 | 794.7 | 954.8 | 121.4 | 1,342.3 |
| | 1998 | 2,619.5 | 119.7 | 68.4 | 22.7 | 2.3 | 901.7 | 1,047.4 | 121.6 | 1,328.5 |
| GBO | 1960 | 6,419.2 | 16.0 | 11.6 | 1.7 | 12.7 | 742.8 | 778.4 | 74.6 | n/d |
| | 1970 | 6,447.3 | 17.2 | 14.1 | 1.5 | 10.6 | 773.5 | 806.0 | 74.5 | 5,538.3 |
| | 1985 | 6,398.7 | 18.0 | 16.6 | 2.0 | 10.1 | 772.9 | 803.2 | 74.7 | 5,530.5 |
| | 1990 | 6,398.7 | 18.4 | 17.0 | 2.2 | 10.1 | 772.5 | 803.4 | 74.3 | 5,487.4 |
| | 1998 | 6,413.9 | 16.8 | 15.6 | 2.3 | 10.0 | 776.6 | 806.0 | 74.9 | 5,498.1 |
| TOTAL | 1985 | 14,442.3 | 807.5 | 540.5 | 82.3 | 31.0 | 3,643.7 | 4,585.9 | | |
| | 1990 | 14,442.4 | 819.9 | 569.2 | 98.2 | 27.1 | 3,563.3 | 4,526.4 | Cannot calculate | |
| | 1998 | 14,408.0 | 648.5 | 435.2 | 102.8 | 23.1 | 3,692.4 | 4,583.7 | | |

Source: State Statistical Agency.