**Carbon emissions with forest cover change and wood harvest in the dry temperate region of Pakistan between 1908 and 2015**

**Supplementary materials. 1.** History of forests management regimes

In the study area, forest management starts when the area come under the suzerainty of British India in 1876. In 1908 the first technical report on forests was made, the forests area was assessed. An annual yield was prescribed which include removal of 3567 class-1 (more than 60 cm in diameter) trees of deodar and kail, 750 class II and III (46-60 cm) deodar trees. In the year of 1929, 1934 and 1944 various inspections were made, and trees were marked for felling and logging for example in 1942 and 1944, about 2000 and 6000 class-I and II were marked respectively. During 1908-1929, and 1930-1944, logging operations were made by the British government under the state administrator. In 1946 the first preliminary working plan report was prepared, and the forests were divided into compartments and sub-compartments with stock maps. In 1947 the state became part of Pakistan; however, it was under a state ruler called Mehtar (state administrator, all the forests were owned by the state and the local people holds the rights of fuelwood and fodder collection, grazing and timber for construction. During 1947-1962, various marking, logging and transportation operations were conducted at different intervals. In 1966 the forests were brought under a regular working plan (the working plan was prepared initially for 1966-1988, however, it is still under implementation with revisions accordingly. The forest area was divided into 364 compartments and sub-compartments. For the management, the forests were divided into commercial and protection working circles. The forest growing stock was measured using stratified random sampling. For harvesting, an exploitable size of 70 cm with a rotation age of 200 years was fixed under the Indian selection system. An annual yield of 14158 m3 was prescribed; out of which 2832 m3 was reserved for domestic needs (domestic timber was increased to 4247 m3 in 1998).

The state government was abolished in 1969 and the government of Pakistan became the owner of forests. In 1975the forests were declared as protected forests, where the ownership of forests belonged to the state, while local people were given the rights of fuelwood collection, grazing, domestic timber requirements, 60% share in income as royalty from commercial harvesting. In 1993 the government of Pakistan imposed a green felling logging ban. In 2004 community participation rules were promulgated through forests ordinance 2002, to launch joint forest management. For management, currently the forests are divided into three working circles which are;(1) timber production working circle (managed for commercial harvesting and include all compartments that are well stock and), (2) community working circle (include compartments on which dependency of local communities for timber, fuelwood, grazing fodder is high) and conservation working circle (include all compartment that are degraded and need improvement).

**Supplementary method 1:** The forest department calculated the requirements of fuelwood and for the each working plan period (Mannan, 2009), which are 11.32 and 9.46 m3 respectively. Then we calculate each year population growth from 1908-2015 using the population growth % of different census reports of 1947-1960, 1970, 1981-1998, 2015 (PBS, 2017).). Using population growth percent, we thus measured the increase in population each year. We then calculated the year wise wood consumption by multiplying the average household fuelwood and timber requirements with the total number of households for each year.

**Supplementary Table 1**

GIS validaition and data classification accuracy

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Reference data for validation | | | | |  | Classification accuracy | | |
|  |  | FOR | S&G | RL | AL | BM |  | User | Producer | Kappa |
| 1973 Classified data | |  |  |  |  |  |  |  |  |  |
|  | Forest (FOR) | **100** | 0 | 0 | 0 | 0 |  | 100.0 | 88.2 | 0.88 |
|  | Snow & Glaciers(S&G) | 0 | **95** | 4 | 0 | 1 |  | 95.1 | 90.6 | 0.95 |
|  | Rangeland (RL) | 1 | 0 | **87** | 8 | 4 |  | 86.8 | 93.0 | 0.99 |
|  | Agriculture land (AL) | 6 | 0 | 8 | **77** | 8 |  | 77.5 | 90.2 | 0.86 |
|  | Barren Mountains (BM) | 1 | 10 | 0 | 0 | **89** |  | 88.6 | 87.5 | 0.99 |
|  | Total Accuracy |  |  |  |  |  |  | **88.9** |  | **0.87** |
| 1993 Classified data | |  |  |  |  |  |  |  |  |  |
|  | Forest (FOR) | **100** | 0 | 0 | 0 | 0 |  | 100.0 | 96.7 | 0.97 |
|  | Snow & Glaciers(S&G) | 0 | **93** | 3 | 0 | 4 |  | 93.5 | 100.0 | 0.93 |
|  | Rangeland (RL) | 0 | 0 | **96** | 2 | 2 |  | 95.5 | 97.3 | 0.98 |
|  | Agriculture land (AL) | 1 | 0 | 0 | **99** | 0 |  | 98.6 | 95.9 | 0.97 |
|  | Barren Mountains (BM) | 0 | 0 | 0 | 0 | **100** |  | 100.0 | 93.1 | 0.93 |
|  | Total Accuracy |  |  |  |  |  |  | **96.8** |  | **0.98** |
| 2015 Classified data | |  |  |  |  |  |  |  |  |  |
|  | Forest (FOR) | **97** | 0 | 0 | 3 | 0 |  | 100.0 | 96.9 | 0.97 |
|  | Snow & Glaciers(S&G) | 0 | **99** | 1 | 0 | 0 |  | 98.8 | 100.0 | 0.99 |
|  | Rangeland (RL) | 0 | 0 | **83** | 0 | 17 |  | 98.1 | 80.0 | 0.82 |
|  | Agriculture land (AL) | 0 | 0 | 0 | **100** | 0 |  | 96.7 | 98.3 | 0.98 |
|  | Barren Mountain (BM) | 0 | 0 | 2 | 0 | **98** |  | 83.0 | 98.4 | 0.84 |
|  | Total Accuracy |  |  |  |  |  |  | **94.9** |  | **0.96** |

**Supplementary Table 2.**

Forest covers change over the different period since 1973

|  |  |  |
| --- | --- | --- |
| Period | Forest area (hactare) | Percent |
| 1973 | 89938 | 6.1 |
| 1993 | 82540 | 5.6 |
| 2015 | 68904 | 4.6 |
| Change | 29821 | 2.0 |



**Supplementary fig.1**. Land uses (ha) and land use change (ha) 1973, 1993 and 2014

**Supplementary table 3**

Annual wood harvest (million m3) and carbon loss (million Mg C) related to wood harvest and deforestation

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Periods | AD  WH | AF  WH | ACM  WH | AT  WH | ACLD  WH | ACLF  WH | ACL  CWH | ACLT  WH | ACL  DF | TCL |
| 1908-1929 | 0.0007 | 0.11 | 0.0018 | 0.110 | 0.00023 | 0.049 | 0.00059 | 0.050 |  | 0.055 |
| 1930- 1947 | 0.0008 | 0.12 | 0.0076 | 0.132 | 0.00026 | 0.057 | 0.00247 | 0.059 |  | 0.068 |
| 1948-1972 | 0.0028 | 0.15 | 0.0021 | 0.159 | 0.00092 | 0.071 | 0.00068 | 0.072 |  | 0.084 |
| 1973-1992 | 0.0071 | 0.27 | 0.0019 | 0.283 | 0.00231 | 0.126 | 0.00063 | 0.129 | 0.024 | 0.153 |
| 1993-2015 | 0.0086 | 0.46 | 0.0077 | 0.473 | 0.00279 | 0.210 | 0.00251 | 0.215 | 0.039 | 0.254 |
| Mean | 0.0041 | 0.2 | 0.0042 | 0.234 | 0.00132 | 0.104 | 0.00135 | 0.525 | 0.031 | 0.543 |

ADWH= annual domestic wood harvest, AFWH=annual fuelwood harvest, ACMWH= annual commerical wood harvest, ATWH= annual Total wood harvest, ACLDWH= annual carbon loss of domestic wood harvest, ACLFWH= annual carbon loss of fuelwood harvest, annual carbon loss of commerical wood harvest, ACLTWH= annual carbon loss of totalwood harvest, ACLDF= annual carbon loss of deforestation harvest, TCL= annual carbon loss of wood harvest and deforestation



**Supplementary fig.2**. Fuel wood sources (%)



**Supplementary**. Fig 3. Livestock feeding pattern (%)



**Supplementary fig.4.** Livelihood sources (%)



**Supplementary fig.5.** Fodder sources (%)

**Supplementary table 4**.

Live stock statistics

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cattles | Sheep | Camels | Mules | Buffalos | Goats | Horses | Ass | Total |
| 1998 | 173262 | 188822 | 2 | 9 | 279 | 335780 | 1194 | 5276 | 704624 |
| 2015 | 174842 | 181146 | 0 | 63 | 296 | 347977 | 295 | 3256 | 707875 |

**Supplementary table 5** .

Growing stock and biomass carbon stock (Mg C ha-1) at respective diameter classes

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Dia class cm | D ha-1 | BA m2ha-1 | V  m3ha-1 | STBM Mg ha-1 | AGB Mg ha-1 | BGB Mg ha-1 | TBM Mg ha-1 | AGBC Mg ha-1 | BGBC Mg ha-1 | TBC Mg ha-1 |
| DF | 20 | 6 | 0.19 | 0.09 | 0.05 | 0.08 | 0.02 | 0.10 | 0.04 | 0.01 | 0.05 |
|  | 30-40 | 39 | 3.78 | 14.87 | 8.92 | 13.65 | 2.59 | 16.25 | 6.83 | 1.30 | 8.12 |
|  | 50-60 | 51 | 12.04 | 59.90 | 35.94 | 54.99 | 10.45 | 65.43 | 27.49 | 5.22 | 32.72 |
|  | 70-140 | 37 | 31.96 | 104.12 | 62.47 | 95.58 | 18.16 | 113.74 | 47.79 | 9.08 | 56.87 |
| Total |  | 133 | 47.96 | 178.98 | 107.39 | 164.30 | 31.22 | 195.52 | 82.15 | 15.61 | 97.76 |
| SD |  | 19.01 | 14.20 | 47.05 | 28.23 | 43.19 | 8.21 | 51.40 | 21.60 | 4.10 | 25.70 |
| OF | 20 | 8 | 0.25 | 0.44 | 0.26 | 0.40 | 0.08 | 0.48 | 0.20 | 0.04 | 0.24 |
|  | 30-40 | 24 | 2.29 | 14.79 | 8.87 | 13.58 | 2.58 | 16.16 | 6.79 | 1.29 | 8.08 |
|  | 50-60 | 21 | 5.01 | 29.43 | 17.66 | 27.01 | 5.13 | 32.15 | 13.51 | 2.57 | 16.07 |
|  | 70-140 | 10 | 8.32 | 18.43 | 11.06 | 16.92 | 3.21 | 20.14 | 8.46 | 1.61 | 10.07 |
| Total |  | 62 | 15.87 | 63.09 | 37.85 | 57.92 | 11.00 | 68.92 | 28.96 | 5.50 | 34.46 |
| SD |  | 8.01 | 3.50 | 11.97 | 7.18 | 10.99 | 2.09 | 13.07 | 5.49 | 1.04 | 6.54 |
| Mean | 20 | 7 | 0.22 | 0.26 | 0.16 | 0.24 | 0.05 | 0.29 | 0.12 | 0.02 | 0.14 |
|  | 30-40 | 32 | 3.03 | 14.83 | 8.90 | 13.61 | 2.59 | 16.20 | 6.81 | 1.29 | 8.10 |
|  | 50-60 | 36 | 8.52 | 44.66 | 26.80 | 41.00 | 7.79 | 48.79 | 20.50 | 3.90 | 24.40 |
|  | 70-140 | 23 | 20.14 | 61.27 | 36.76 | 56.25 | 10.69 | 66.94 | 28.13 | 5.34 | 33.47 |
| Total |  | 98 | 31.92 | 121.03 | 72.62 | 111.11 | 21.11 | 132.22 | 55.55 | 10.56 | 66.11 |
| SD |  | 12.71 | 8.81 | 27.73 | 16.64 | 25.46 | 4.84 | 30.30 | 12.73 | 2.42 | 15.15 |

DF= Dense forest, OF= Open forest, Mean= Average of DF abd OF, Dia= diameter, D= Stem density, BA= Basal area, V= Volume, STBM= Stem biomass, AGB= Above-ground biomass, BGB= Below-ground biomass, AGBC=Above-ground biomass carbon, BGBC= Below-ground biomass, TBC= Total above and below ground biomass carbon.

**Supplementary table 6**:

Forest covers change and annual rate of deforestation from 1850 to 2015 in different regions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Region | Forest area  1850 (Mha) | Forest area 2015 (Mha) | Change (Mha) | Percent change | Annual of rate deforestation (%) |
| Tropical Africa | 792 | 614 | 178 | 22.47 | 0.14 |
| Latin America | 1248 | 932 | 316 | 25.32 | 0.15 |
| South & southeast Asia | 533 | 326 | 207 | 38.84 | 0.24 |
| North America | 768 | 657 | 111 | 14.45 | 0.08 |
| East Asia | 64 | 49 | 15 | 23.44 | 0.14 |
| Oceania | 210 | 140 | 70 | 33.33 | 0.20 |

Source. Houghton and Nassikas., 2015



**Supplementary fig.6.** Percent contribution of wood harvest variables

**Supplementary Materials 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Year** | **Population** | **Hose hold** | **P. growth %** | **increase in population** | **New hoses** | **Timber required per house** | **Total timber for houses** | **Fuel wood/house hold** | **Total fuel wood** | **Commercial harvest** | **Total harvest** | **Biomass of domestic harvest** | **Biomass of fuel wood** | **Biomass commercial harvest** | **carbon of domestic harvest** | **Carbon of fuel wood** | **Carbon of commercial harvest** | **Total carbon of wood harvest** |
|  | 1908 | 78161 | 9770 | 0.7 | 547 | 68 | 9.46 | 647 | 11.32 | 99538 | 0 | 100185 | 419 | 91376 | 0 | 210 | 45688 | 0 | 45898 |
|  | 1909 | 78712 | 9839 | 0.7 | 551 | 69 | 9.46 | 652 | 11.32 | 100240 | 0 | 100892 | 422 | 92020 | 0 | 211 | 46010 | 0 | 46221 |
|  | 1910 | 79267 | 9908 | 0.7 | 555 | 69 | 9.46 | 656 | 11.32 | 100947 | 0 | 101603 | 425 | 92669 | 0 | 213 | 46334 | 0 | 46547 |
|  | 1911 | 79826 | 9978 | 0.7 | 559 | 70 | 9.46 | 661 | 11.32 | 101658 | 0 | 102319 | 428 | 93322 | 0 | 214 | 46661 | 0 | 46875 |
|  | 1912 | 80389 | 10049 | 0.7 | 563 | 70 | 9.46 | 665 | 11.32 | 102375 | 0 | 103040 | 431 | 93980 | 0 | 216 | 46990 | 0 | 47206 |
|  | 1913 | 80955 | 10119 | 0.7 | 567 | 71 | 9.46 | 670 | 11.32 | 103097 | 0 | 103767 | 434 | 94643 | 0 | 217 | 47321 | 0 | 47538 |
|  | 1914 | 81526 | 10191 | 0.7 | 571 | 71 | 9.46 | 675 | 11.32 | 103823 | 0 | 104498 | 437 | 95310 | 0 | 219 | 47655 | 0 | 47873 |
|  | 1915 | 82101 | 10263 | 0.7 | 575 | 72 | 9.46 | 680 | 11.32 | 104555 | 0 | 105235 | 440 | 95982 | 0 | 220 | 47991 | 0 | 48211 |
|  | 1916 | 82679 | 10335 | 0.7 | 579 | 72 | 9.46 | 684 | 11.32 | 105292 | 0 | 105977 | 443 | 96658 | 0 | 222 | 48329 | 0 | 48551 |
|  | 1917 | 83262 | 10408 | 0.7 | 583 | 73 | 9.46 | 689 | 11.32 | 106034 | 0 | 106724 | 446 | 97340 | 0 | 223 | 48670 | 0 | 48893 |
|  | 1918 | 83849 | 10481 | 0.7 | 587 | 73 | 9.46 | 694 | 11.32 | 106782 | 0 | 107476 | 450 | 98026 | 0 | 225 | 49013 | 0 | 49238 |
|  | 1919 | 84440 | 10555 | 0.7 | 591 | 74 | 9.46 | 699 | 11.32 | 107535 | 0 | 108234 | 453 | 98717 | 0 | 226 | 49358 | 0 | 49585 |
|  | 1920 | 85036 | 10629 | 0.7 | 595 | 74 | 9.46 | 704 | 11.32 | 108293 | 0 | 108997 | 456 | 99413 | 0 | 228 | 49706 | 0 | 49934 |
|  | 1921 | 85635 | 10704 | 0.7 | 599 | 75 | 9.46 | 709 | 11.32 | 109056 | 0 | 109765 | 459 | 100114 | 0 | 230 | 50057 | 0 | 50286 |
|  | 1922 | 86239 | 10780 | 0.7 | 604 | 75 | 9.46 | 714 | 11.32 | 109825 | 0 | 110539 | 462 | 100819 | 0 | 231 | 50410 | 0 | 50641 |
|  | 1923 | 86847 | 10856 | 0.7 | 608 | 76 | 9.46 | 719 | 11.32 | 110599 | 0 | 111318 | 466 | 101530 | 0 | 233 | 50765 | 0 | 50998 |
|  | 1924 | 87459 | 10932 | 0.7 | 612 | 77 | 9.46 | 724 | 11.32 | 111379 | 0 | 112103 | 469 | 102246 | 0 | 234 | 51123 | 0 | 51357 |
|  | 1925 | 88075 | 11009 | 0.7 | 617 | 77 | 9.46 | 729 | 11.32 | 112164 | 0 | 112893 | 472 | 102966 | 0 | 236 | 51483 | 0 | 51719 |
|  | 1926 | 88696 | 11087 | 0.7 | 621 | 78 | 9.46 | 734 | 11.32 | 112955 | 0 | 113689 | 476 | 103692 | 0 | 238 | 51846 | 0 | 52084 |
|  | 1927 | 89321 | 11165 | 0.7 | 625 | 78 | 9.46 | 739 | 11.32 | 113751 | 0 | 114490 | 479 | 104423 | 0 | 239 | 52212 | 0 | 52451 |
|  | 1928 | 89951 | 11244 | 0.7 | 630 | 79 | 9.46 | 745 | 11.32 | 114553 | 0 | 115297 | 482 | 105159 | 0 | 241 | 52580 | 0 | 52821 |
|  | 1929 | 90585 | 11323 | 0.7 | 634 | 79 | 9.46 | 750 | 11.32 | 115360 | 40140 | 156250 | 486 | 105901 | 26002 | 243 | 52950 | 13001 | 66194 |
| **Total** |  |  |  |  | 12971 | 1621 |  | 15338 |  | 2359810 | 40140 | 2415288 |  |  |  | 4968 | 1083153 | 13001 | 1101122 |
| **Mean** |  |  |  |  | 590 | 74 |  | 697 |  | 107264 | 1825 | 109786 |  |  |  | 226 | 49234 | 591 | 50051 |
|  | 1930 | 91224 | 11403 | 0.7 | 639 | 80 | 9.46 | 755 | 11.32 | 116173 | 0 | 116929 | 489 | 106647 | 0 | 245 | 53324 | 0 | 53568 |
|  | 1931 | 91867 | 11483 | 0.7 | 643 | 80 | 9.46 | 760 | 11.32 | 116992 | 0 | 117753 | 493 | 107399 | 0 | 246 | 53699 | 0 | 53946 |
|  | 1932 | 92514 | 11564 | 0.7 | 648 | 81 | 9.46 | 766 | 11.32 | 117817 | 0 | 118583 | 496 | 108156 | 0 | 248 | 54078 | 0 | 54326 |
|  | 1933 | 93167 | 11646 | 0.7 | 652 | 82 | 9.46 | 771 | 11.32 | 118648 | 0 | 119419 | 500 | 108919 | 0 | 250 | 54459 | 0 | 54709 |
|  | 1934 | 93823 | 11728 | 0.7 | 657 | 82 | 9.46 | 777 | 11.32 | 119484 | 7554 | 127815 | 503 | 109686 | 4893 | 252 | 54843 | 2447 | 57541 |
|  | 1935 | 94485 | 11811 | 0.7 | 661 | 83 | 9.46 | 782 | 11.32 | 120326 | 0 | 121108 | 507 | 110460 | 0 | 253 | 55230 | 0 | 55483 |
|  | 1936 | 95151 | 11894 | 0.7 | 666 | 83 | 9.46 | 788 | 11.32 | 121175 | 3777 | 125739 | 510 | 111238 | 2447 | 255 | 55619 | 1223 | 57098 |
|  | 1937 | 95822 | 11978 | 0.7 | 671 | 84 | 9.46 | 793 | 11.32 | 122029 | 62950 | 185772 | 514 | 112022 | 40778 | 257 | 56011 | 20389 | 76657 |
|  | 1938 | 96497 | 12062 | 0.7 | 675 | 84 | 9.46 | 799 | 11.32 | 122889 | 0 | 123688 | 517 | 112812 | 0 | 259 | 56406 | 0 | 56665 |
|  | 1939 | 97177 | 12147 | 0.7 | 680 | 85 | 9.46 | 804 | 11.32 | 123755 | 0 | 124560 | 521 | 113607 | 0 | 261 | 56804 | 0 | 57064 |
|  | 1940 | 97862 | 12233 | 0.7 | 685 | 86 | 9.46 | 810 | 11.32 | 124628 | 0 | 125438 | 525 | 114408 | 0 | 262 | 57204 | 0 | 57466 |
|  | 1941 | 98552 | 12319 | 0.7 | 690 | 86 | 9.46 | 816 | 11.32 | 125506 | 0 | 126322 | 528 | 115215 | 0 | 264 | 57607 | 0 | 57872 |
|  | 1942 | 99247 | 12406 | 0.7 | 695 | 87 | 9.46 | 822 | 11.32 | 126391 | 25180 | 152392 | 532 | 116027 | 16311 | 266 | 58013 | 8156 | 66435 |
|  | 1943 | 99946 | 12493 | 0.7 | 700 | 87 | 9.46 | 827 | 11.32 | 127282 | 0 | 128109 | 536 | 116845 | 0 | 268 | 58422 | 0 | 58690 |
|  | 1944 | 100651 | 12581 | 0.7 | 705 | 88 | 9.46 | 833 | 11.32 | 128179 | 37770 | 166782 | 540 | 117668 | 24467 | 270 | 58834 | 12234 | 71338 |
|  | 1945 | 101361 | 12670 | 0.7 | 710 | 89 | 9.46 | 839 | 11.32 | 129083 | 0 | 129922 | 544 | 118498 | 0 | 272 | 59249 | 0 | 59521 |
|  | 1946 | 102075 | 12759 | 0.7 | 715 | 89 | 9.46 | 845 | 11.32 | 129993 | 0 | 130838 | 547 | 119333 | 0 | 274 | 59667 | 0 | 59940 |
|  | 1947 | 102795 | 12849 | 0.7 | 720 | 90 | 9.46 | 851 | 11.32 | 130909 | 0 | 131760 | 551 | 120174 | 0 | 276 | 60087 | 0 | 60363 |
| **Total** |  |  |  |  | 12210 | 1526 |  | 14438 |  | 2221258 | 137231 | 2372927 |  |  |  | 4676 | 1019557 | 44448 | 1068682 |
| **Mean** |  |  |  |  | 678 | 85 |  | 802 |  | 123403 | 7624 | 131829 |  |  |  | 260 | 56642 | 2469 | 59371 |
|  | 1948 | 103519 | 12940 | 0.7 | 725 | 91 | 9.46 | 857 | 11.32 | 131832 | 0 | 132689 | 555 | 121022 | 0 | 278 | 60511 | 0 | 60788 |
|  | 1949 | 104249 | 13031 | 0.7 | 730 | 91 | 9.46 | 863 | 11.32 | 132761 | 0 | 133624 | 559 | 121875 | 0 | 279 | 60937 | 0 | 61217 |
|  | 1950 | 104984 | 13123 | 0.7 | 735 | 92 | 9.46 | 869 | 11.32 | 133697 | 0 | 134566 | 563 | 122734 | 0 | 281 | 61367 | 0 | 61648 |
|  | 1951 | 105724 | 13216 | 0.7 | 740 | 93 | 9.46 | 875 | 11.32 | 134640 | 0 | 135515 | 567 | 123599 | 0 | 283 | 61800 | 0 | 62083 |
|  | 1952 | 106464 | 13308 | 0.7 | 745 | 93 | 9.46 | 881 | 11.32 | 135582 | 0 | 136463 | 571 | 124464 | 0 | 285 | 62232 | 0 | 62518 |
|  | 1953 | 107209 | 13401 | 0.7 | 750 | 94 | 9.46 | 887 | 11.32 | 136531 | 0 | 137418 | 575 | 125336 | 0 | 287 | 62668 | 0 | 62955 |
|  | 1954 | 107960 | 13495 | 0.7 | 756 | 94 | 9.46 | 894 | 11.32 | 137487 | 0 | 138380 | 579 | 126213 | 0 | 289 | 63106 | 0 | 63396 |
|  | 1955 | 108716 | 13589 | 0.7 | 761 | 95 | 9.46 | 900 | 11.32 | 138449 | 9301 | 148650 | 583 | 127096 | 6025 | 291 | 63548 | 3013 | 66852 |
|  | 1956 | 109477 | 13685 | 0.7 | 766 | 96 | 9.46 | 906 | 11.32 | 139418 | 4310 | 144635 | 587 | 127986 | 2792 | 294 | 63993 | 1396 | 65683 |
|  | 1957 | 110243 | 13780 | 0.7 | 772 | 96 | 9.46 | 913 | 11.32 | 140394 | 0 | 141307 | 591 | 128882 | 0 | 296 | 64441 | 0 | 64737 |
|  | 1958 | 111015 | 13877 | 0.7 | 777 | 97 | 9.46 | 919 | 11.32 | 141377 | 0 | 142296 | 595 | 129784 | 0 | 298 | 64892 | 0 | 65190 |
|  | 1960 | 111792 | 13974 | 0.7 | 783 | 98 | 9.46 | 925 | 11.32 | 142367 | 0 | 143292 | 599 | 130693 | 0 | 300 | 65346 | 0 | 65646 |
|  | 1961 | 113057 | 14132 | 3 | 3392 | 424 | 9.46 | 4011 | 11.32 | 143978 | 0 | 147989 | 2598 | 132172 | 0 | 1299 | 66086 | 0 | 67385 |
|  | 1962 | 116449 | 14556 | 3 | 3493 | 437 | 9.46 | 4131 | 11.32 | 148297 | 0 | 152428 | 2676 | 136137 | 0 | 1338 | 68069 | 0 | 69407 |
|  | 1963 | 119942 | 14993 | 3 | 3598 | 450 | 9.46 | 4255 | 11.32 | 152746 | 0 | 157001 | 2756 | 140221 | 0 | 1378 | 70111 | 0 | 71489 |
|  | 1964 | 123540 | 15443 | 3 | 3706 | 463 | 9.46 | 4383 | 11.32 | 157329 | 7827 | 169538 | 2839 | 144428 | 5070 | 1420 | 72214 | 2535 | 76168 |
|  | 1965 | 127247 | 15906 | 3 | 3817 | 477 | 9.46 | 4514 | 11.32 | 162049 | 5760 | 172323 | 2924 | 148761 | 3731 | 1462 | 74380 | 1866 | 77708 |
|  | 1966 | 131064 | 16383 | 3 | 3932 | 491 | 9.46 | 4649 | 11.32 | 166910 | 0 | 171560 | 3012 | 153223 | 0 | 1506 | 76612 | 0 | 78118 |
|  | 1967 | 134996 | 16874 | 3 | 4050 | 506 | 9.46 | 4789 | 11.32 | 171917 | 5115 | 181821 | 3102 | 157820 | 3313 | 1551 | 78910 | 1657 | 82118 |
|  | 1968 | 139046 | 17381 | 3 | 4171 | 521 | 9.46 | 4933 | 11.32 | 177075 | 2373 | 184381 | 3195 | 162555 | 1537 | 1598 | 81277 | 769 | 83644 |
|  | 1969 | 143217 | 17902 | 3 | 4297 | 537 | 9.46 | 5081 | 11.32 | 182387 | 5565 | 193033 | 3291 | 167431 | 3605 | 1646 | 83716 | 1802 | 87164 |
|  | 1970 | 147514 | 18439 | 3 | 4425 | 553 | 9.46 | 5233 | 11.32 | 187859 | 4857 | 197949 | 3390 | 172454 | 3146 | 1695 | 86227 | 1573 | 89495 |
|  | 1971 | 151939 | 18992 | 3 | 4558 | 570 | 9.46 | 5390 | 11.32 | 193495 | 492 | 199377 | 3492 | 177628 | 319 | 1746 | 88814 | 159 | 90719 |
|  | 1972 | 159000 | 19875 | 3.3 | 5247 | 656 | 9.46 | 6205 | 11.32 | 202487 | 4504 | 213195 | 4019 | 185883 | 2918 | 2010 | 92941 | 1459 | 96410 |
| **Total** |  |  |  |  | 57727 | 7216 |  | 68262 |  | 3691063 | 50104 | 3809429 |  |  |  | 22110 | 1694198 | 16228 | 1732536 |
| **Mean** |  |  |  |  | 2405 | 301 |  | 2844 |  | 153794 | 2088 | 158726 |  |  |  | 921 | 70592 | 676 | 72189 |
|  | 1973 | 164247 | 20531 | 3.3 | 5420 | 678 | 9.46 | 6409 | 11.32 | 209169 | 2101 | 217679 | 4152 | 192017 | 1361 | 2076 | 96008 | 681 | 98765 |
|  | 1974 | 169667 | 21208 | 3.3 | 5599 | 700 | 9.46 | 6621 | 11.32 | 216071 | 0 | 222692 | 4289 | 198353 | 0 | 2144 | 99177 | 0 | 101321 |
|  | 1975 | 175266 | 21908 | 3.3 | 5784 | 723 | 9.46 | 6839 | 11.32 | 223201 | 0 | 230041 | 4430 | 204899 | 0 | 2215 | 102449 | 0 | 104665 |
|  | 1976 | 181050 | 22631 | 3.3 | 5975 | 747 | 9.46 | 7065 | 11.32 | 230567 | 0 | 237632 | 4577 | 211661 | 0 | 2288 | 105830 | 0 | 108119 |
|  | 1977 | 187025 | 23378 | 3.3 | 6172 | 771 | 9.46 | 7298 | 11.32 | 238176 | 1776 | 247250 | 4728 | 218645 | 1150 | 2364 | 109323 | 575 | 112262 |
|  | 1978 | 193196 | 24150 | 3.3 | 6375 | 797 | 9.46 | 7539 | 11.32 | 246036 | 0 | 253575 | 4884 | 225861 | 0 | 2442 | 112930 | 0 | 115372 |
|  | 1979 | 199572 | 24946 | 3.3 | 6586 | 823 | 9.46 | 7788 | 11.32 | 254155 | 828 | 262771 | 5045 | 233314 | 536 | 2522 | 116657 | 268 | 119448 |
|  | 1980 | 206158 | 25770 | 3.3 | 6803 | 850 | 9.46 | 8045 | 11.32 | 262542 | 0 | 270587 | 5211 | 241013 | 0 | 2606 | 120507 | 0 | 123112 |
|  | 1981 | 208560 | 26070 | 2.52 | 5256 | 657 | 9.46 | 6215 | 11.32 | 265601 | 0 | 271816 | 4026 | 243822 | 0 | 2013 | 121911 | 0 | 123924 |
|  | 1982 | 213816 | 26727 | 2.52 | 5388 | 674 | 9.46 | 6371 | 11.32 | 272294 | 0 | 278666 | 4127 | 249966 | 0 | 2064 | 124983 | 0 | 127047 |
|  | 1983 | 219204 | 27400 | 2.52 | 5524 | 690 | 9.46 | 6532 | 11.32 | 279156 | 0 | 285688 | 4231 | 256265 | 0 | 2116 | 128133 | 0 | 130248 |
|  | 1984 | 224728 | 28091 | 2.52 | 5663 | 708 | 9.46 | 6697 | 11.32 | 286191 | 3204 | 296092 | 4338 | 262723 | 2076 | 2169 | 131362 | 1038 | 134568 |
|  | 1985 | 230391 | 28799 | 2.52 | 5806 | 726 | 9.46 | 6865 | 11.32 | 293403 | 3885 | 304153 | 4447 | 269344 | 2517 | 2224 | 134672 | 1258 | 138154 |
|  | 1986 | 236197 | 29525 | 2.52 | 5952 | 744 | 9.46 | 7038 | 11.32 | 300797 | 3243 | 311078 | 4559 | 276131 | 2101 | 2280 | 138066 | 1050 | 141396 |
|  | 1987 | 242149 | 30269 | 2.52 | 6102 | 763 | 9.46 | 7216 | 11.32 | 308377 | 797 | 316389 | 4674 | 283090 | 516 | 2337 | 141545 | 258 | 144140 |
|  | 1988 | 248251 | 31031 | 2.52 | 6256 | 782 | 9.46 | 7398 | 11.32 | 316148 | 2355 | 325900 | 4792 | 290224 | 1526 | 2396 | 145112 | 763 | 148271 |
|  | 1990 | 254507 | 31813 | 2.52 | 6414 | 802 | 9.46 | 7584 | 11.32 | 324115 | 4495 | 336194 | 4913 | 297537 | 2912 | 2456 | 148769 | 1456 | 152681 |
|  | 1991 | 260921 | 32615 | 2.52 | 6575 | 822 | 9.46 | 7775 | 11.32 | 332282 | 4635 | 344693 | 5037 | 305035 | 3003 | 2518 | 152518 | 1501 | 156537 |
|  | 1992 | 267496 | 33437 | 2.52 | 6741 | 843 | 9.46 | 7971 | 11.32 | 340656 | 9352 | 357979 | 5164 | 312722 | 6058 | 2582 | 156361 | 3029 | 161972 |
| **Total** |  |  |  |  | 114391 | 14299 |  | 135267 |  | 5198936 | 36671 | 5370874 |  |  |  | 43812 | 2386312 | 11878 | 2442001 |
| **Mean** |  |  |  |  | 6021 | 753 |  | 7119 |  | 273628 | 1930 | 282678 |  |  |  | 2306 | 125595 | 625 | 128526 |
|  | 1993 | 274237 | 34280 | 2.52 | 6911 | 864 | 9.46 | 8172 | 11.32 | 349240 | 1509 | 358921 | 5294 | 320603 | 978 | 2647 | 160301 | 489 | 163437 |
|  | 1994 | 281147 | 35143 | 2.52 | 7085 | 886 | 9.46 | 8378 | 11.32 | 358041 | 2834 | 369254 | 5427 | 328682 | 1836 | 2714 | 164341 | 918 | 167973 |
|  | 1995 | 288232 | 36029 | 2.52 | 7263 | 908 | 9.46 | 8589 | 11.32 | 367064 | 0 | 375653 | 5564 | 336965 | 0 | 2782 | 168482 | 0 | 171264 |
|  | 1996 | 295496 | 36937 | 2.52 | 7446 | 931 | 9.46 | 8805 | 11.32 | 376314 | 0 | 385119 | 5704 | 345456 | 0 | 2852 | 172728 | 0 | 175580 |
|  | 1997 | 302942 | 37868 | 2.52 | 7634 | 954 | 9.46 | 9027 | 11.32 | 385797 | 0 | 394824 | 5848 | 354162 | 0 | 2924 | 177081 | 0 | 180005 |
|  | 1998 | 318689 | 39836 | 2.52 | 8031 | 1004 | 9.46 | 9497 | 11.32 | 405850 | 0 | 415347 | 6152 | 372571 | 0 | 3076 | 186285 | 0 | 189361 |
|  | 1999 | 326720 | 40840 | 1.9 | 6208 | 776 | 9.46 | 7341 | 11.32 | 416078 | 0 | 423418 | 4755 | 381959 | 0 | 2378 | 190980 | 0 | 193357 |
|  | 2000 | 332928 | 41616 | 1.9 | 6326 | 791 | 9.46 | 7480 | 11.32 | 423983 | 0 | 431463 | 4846 | 389217 | 0 | 2423 | 194608 | 0 | 197031 |
|  | 2001 | 339253 | 42407 | 1.9 | 6446 | 806 | 9.46 | 7622 | 11.32 | 432039 | 0 | 439661 | 4938 | 396612 | 0 | 2469 | 198306 | 0 | 200775 |
|  | 2002 | 345699 | 43212 | 1.9 | 6568 | 821 | 9.46 | 7767 | 11.32 | 440248 | 0 | 448015 | 5031 | 404147 | 0 | 2516 | 202074 | 0 | 204589 |
|  | 2003 | 352267 | 44033 | 1.9 | 6693 | 837 | 9.46 | 7915 | 11.32 | 448612 | 0 | 456527 | 5127 | 411826 | 0 | 2563 | 205913 | 0 | 208477 |
|  | 2004 | 358960 | 44870 | 1.9 | 6820 | 853 | 9.46 | 8065 | 11.32 | 457136 | 0 | 465201 | 5224 | 419651 | 0 | 2612 | 209825 | 0 | 212438 |
|  | 2005 | 365781 | 45723 | 1.9 | 6950 | 869 | 9.46 | 8218 | 11.32 | 465822 | 0 | 474040 | 5324 | 427624 | 0 | 2662 | 213812 | 0 | 216474 |
|  | 2006 | 372731 | 46591 | 1.9 | 7082 | 885 | 9.46 | 8374 | 11.32 | 474672 | 0 | 483047 | 5425 | 435749 | 0 | 2712 | 217875 | 0 | 220587 |
|  | 2007 | 379812 | 47477 | 1.9 | 7216 | 902 | 9.46 | 8533 | 11.32 | 483691 | 18882 | 511107 | 5528 | 444028 | 12232 | 2764 | 222014 | 6116 | 230894 |
|  | 2008 | 387029 | 48379 | 1.9 | 7354 | 919 | 9.46 | 8696 | 11.32 | 492881 | 19180 | 520757 | 5633 | 452465 | 12425 | 2816 | 226232 | 6212 | 235261 |
|  | 2009 | 394382 | 49298 | 1.9 | 7493 | 937 | 9.46 | 8861 | 11.32 | 502246 | 18766 | 529873 | 5740 | 461062 | 12156 | 2870 | 230531 | 6078 | 239479 |
|  | 2010 | 401876 | 50234 | 1.9 | 7636 | 954 | 9.46 | 9029 | 11.32 | 511789 | 20852 | 541670 | 5849 | 469822 | 13508 | 2924 | 234911 | 6754 | 244589 |
|  | 2011 | 409511 | 51189 | 1.9 | 7781 | 973 | 9.46 | 9201 | 11.32 | 521513 | 20193 | 550906 | 5960 | 478749 | 13081 | 2980 | 239374 | 6540 | 248895 |
|  | 2012 | 417292 | 52162 | 1.9 | 7929 | 991 | 9.46 | 9376 | 11.32 | 531421 | 19062 | 559859 | 6073 | 487845 | 12348 | 3037 | 243922 | 6174 | 253133 |
|  | 2013 | 425221 | 53153 | 1.9 | 8079 | 1010 | 9.46 | 9554 | 11.32 | 541518 | 20505 | 571577 | 6189 | 497114 | 13283 | 3094 | 248557 | 6641 | 258293 |
|  | 2014 | 433300 | 54162 | 1.9 | 8233 | 1029 | 9.46 | 9735 | 11.32 | 551807 | 17464 | 579006 | 6306 | 506559 | 11313 | 3153 | 253280 | 5657 | 262089 |
|  | 2015 | 441532 | 55192 | 1.9 | 8389 | 1049 | 9.46 | 9920 | 11.32 | 562292 | 18837 | 591049 | 6426 | 516184 | 12202 | 3213 | 258092 | 6101 | 267406 |
| **Total** |  |  |  |  | 167572 | 20947 |  | 198154 |  | 10500056 | 178084 | 10876295 |  |  |  | 64181 | 4819526 | 57681 | 4941388 |
| **Mean** |  |  |  |  | 7286 | 911 |  | 8615 |  | 456524 | 7743 | 472882 |  |  |  | 2790 | 209545 | 2508 | 214843 |