Hw#1 Water Balance

1200 gal/day · 20 million ($10^6$)

1200 gal/day · 2.0 · 107 million

$= 2.4 \cdot 10^{10}$ gallons

$= 2.4 \cdot 10^{10}\ \text{gallon} \left| \frac{3.79 \cdot 10^{-12}\ km^3}{1\ \text{gallon}} \right| = 0.091\ km^3$

$V = \text{area} \cdot \text{depth}$

$\frac{V}{\text{area}} = \frac{\text{area} \cdot \text{depth}}{\text{area}}$

$\frac{V}{A} = \text{depth}$

$= \frac{0.091\ km^3}{1.56 \cdot 10^5\ km^2} = 5.83 \cdot 10^{-7}\ km$

Water deficit: area · depth

$V = a \cdot d$

$V = (1.56 \cdot 10^5\ km^2)(5.83 \cdot 10^{-7}\ km) = 0.091\ km^3$

1983 was the wettest year on record 1224mm

The 3 driest years were 1977, 296mm, 1976, 391mm and 2014 and 384mm

673.91 mm is the average Precipitation

673.91mm − 384 mm = 289.91 mm (wy 2014)

673.91mm − 484mm = 189.91 mm (wy 2015)

$V = a \cdot d \rightarrow V = 1.56 \cdot 10^5\ km^2 (\quad)$

$289.91\ \text{mm} \left| \frac{1\ \text{km}}{1000000\ \text{mm}} \right| = 2.899 \cdot 10^{-4}\ \text{km}$

$189.91\ \text{mm} \left| \frac{1\ \text{km}}{1000000\ \text{mm}} \right| = 1.899 \cdot 10^{-4}\ \text{km}$

$V = 1.56 \cdot 10^5\ \text{km}^2\ (2.899 \cdot 10^{-4}\ \text{km})$ 2014

$= 45.2\ \text{km}^3$

$V = 1.56 \cdot 10^5\ \text{km}^2\ (1.899 \cdot 10^{-4}\ \text{km})$

$= 29.62\ \text{km}^3$

8. The deficit was smaller than expected meaning that the drought won't effect, society for long. Therefore, the society does NOT have to adjust.