

(A)

ESTIMATING DOMESTIC WATER CONSUMPTION



drinking & cooking

$$\begin{aligned}
 V_{\text{drink}}^{(\text{capita})} &\approx \frac{8 \text{ glasses}}{\text{day}} \times \frac{f \times 10^{-1} \text{ L}}{\text{glass}} \approx f \text{ L / day} \\
 V_{\text{cooking}}^{(\text{capita})} &\approx V_{\text{drink}}^{(\text{capita})} \approx f \text{ L / day} \\
 V_{\text{drinking \& cooking}}^{(\text{total})} &\approx 8 \times 10^9 \text{ people} \times \frac{10 \text{ L}}{\text{day} \times \text{person}} \times \frac{365 \text{ days}}{\text{year}} \\
 &\approx f \times 10^{13} \text{ L / year}
 \end{aligned}$$



sanitation

$$\begin{aligned}
 V_{\text{toilet}}^{(\text{capita})} &\approx \frac{f \text{ L}}{\text{flush}} \times \frac{f \text{ flushes}}{\text{day}} \approx 10 \text{ L / day} \\
 V_{\text{shower}}^{(\text{capita})} &\approx \frac{f \text{ L}}{\text{min}} \times \frac{10 \text{ min}}{1 \text{ shower}} \times \frac{f \text{ showers}}{\text{week}} \times \frac{1 \text{ week}}{7 \text{ days}} \\
 &\approx 10 \text{ L / day} \\
 V_{\text{laundry}}^{(\text{capita})} &\approx \frac{10^2 \text{ L}}{\text{load}} \times \frac{1 \text{ load}}{2 \text{ weeks}} \times \frac{1 \text{ week}}{7 \text{ days}} \approx f \text{ L / day} \\
 V_{\text{sanitation}}^{(\text{total})} &\approx 8 \times 10^9 \text{ people} \times \frac{f \times 10 \text{ L}}{\text{day} \times \text{person}} \times \frac{365 \text{ days}}{\text{year}} \\
 &\approx 10^{14} \text{ L / year}
 \end{aligned}$$

(B)

$$V_{\text{consumed}}^{(\text{total})} \approx V_{\text{cooking \& drinking}}^{(\text{total})} + V_{\text{sanitation}}^{(\text{total})} \approx 1.f \times 10^{14} \text{ L / year}$$

