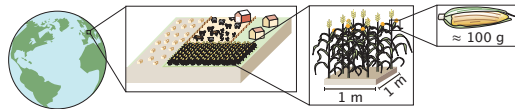


(A) AGRICULTURAL LAND AREA ESTIMATE



$$\begin{aligned} \text{consumed plant mass, } m_{\text{plant}} &\approx \frac{f \times 10^2 \text{ kg}}{\text{person} \times \text{year}} \\ \text{edible mass areal density, } \rho_{\text{plant}} &\approx \frac{1 \text{ kg}}{f \text{ m}^2 \times \text{year}} \quad \text{assuming one-year growing season} \\ \text{cropland per capita, } A_{\text{crop}} &\approx \frac{m_{\text{plant}}}{\rho_{\text{plant}}} \approx \frac{f \times 10^2 \text{ kg}}{\text{person} \times \text{year}} \times \frac{f \text{ m}^2 \times \text{year}}{1 \text{ kg}} \approx \frac{10^3 \text{ m}^2}{\text{person}} \\ \text{pasture land area, } A_{\text{past.}} &\approx f \times A_{\text{crop}} \approx \frac{f \times 10^3 \text{ m}^2}{\text{person}} \end{aligned}$$

$$\begin{aligned} \text{total agricultural land area, } A_{\text{agr.}} &\approx N_{\text{pop}}^{(\text{total})} \times (A_{\text{past.}} + A_{\text{crop}}) \approx 10^{10} \text{ people} \times \frac{f \times 10^3 \text{ m}^2}{\text{person}} \\ &\approx f \times 10^{13} \text{ m}^2 \approx f \times 10^7 \text{ km}^2 \end{aligned}$$

(B) GLOBAL AGRICULTURAL LAND USE

