‘The Swelling Sahara’

a) $S = 9,200,000 \times r^t$

$9,930,000 = 9,200,000 \times r^{50}$

$\ln \frac{993}{920} = 50 \ln r$

$r = e^{\frac{-23}{50}}$

Therefore $S$ increases by 0.15% each year.

[5 marks]

b) $S = 9,200,000 \times 1.0015^{100} = 10,700,000 \text{ km}^2$

[1 mark]