

**Descriptive component (Model Paper)**  
**B.Sc. Biology**

**Read the passage below and answer the questions that appear after it.**

**Question 1**

**The urban farmers battling Bangalore's concrete jungle**

Ramagondanahalli is an urban village being swallowed by the city. It lies on Varthur Lake, one of the biggest in Bangalore, which is known as the Silicon Valley of India. There are copper-tinted dirt roads, small-scale vegetable farms all around Varthur lake.

The once-rural farming community is now part of eastern Bangalore, near the city's mighty IT campuses. This rapid urbanisation has placed urban farmers like Hanumanthappa, who is 45, into a difficult relationship with the city. They are confronted with a choice: continue farming under adverse conditions, or sell their land.

Ramagondanahalli is an example of what's happening throughout Bangalore. The city's concrete-covered area has expanded by 92.5% since 1970, with more farmland being sold off to developers as the city embraces its tech boom. The new urban landscape is testing farmers as they think about how to move forward.

A stream from Varthur Lake irrigates Hanumanthappa's plot. The second biggest lake in Bangalore lies just beyond his farm. He has always used lake water, but now it is extremely polluted. Hanumanthappa knows he's not supposed to use water straight from the lake. But without enough money to drill a borewell, he feels he has no other choice.

Varthur Lake is polluted with both industrial waste and untreated residential sewage from the apartments that line its perimeter. There is no hiding the pollution, since there is froth at the lake's surface, especially when it rains. Upstream, Bellandur Lake periodically catches fire because of the mixture of chemical pollutants it contains.

According to the state government's Department of Agriculture, as Bangalore was witnessing its IT boom and expanding growth, the area covered by vegetable crops in the district decreased from 0.1 million hectares in 2000 to a mere 0.04 million hectares by 2015. As a result, vegetable production went down 72%, from 0.29 million tonnes to 0.08 million tonnes during the same period.

(Adapted from: <https://www.bbc.com/news/world-asia-india-39968365> - some words have been modified for easier reading)

Answer the following questions from this paragraph:

- a. As a scientist in-charge, what biotic and abiotic factors would you measure to determine whether Varthur lake's water quality has deteriorated? (100 word limit)
- b. What are the consequences of Hanumanthappa using Varthur lake's water for growing crops? (100 word limit)
- c. If the concrete-covered area of Bangalore was 80 km<sup>2</sup> in 1970, what is the current concrete-covered area of Bangalore? Show your work.

