# Geography · GS - I

**What is sea surface temperature rise? How does it affect the formation of tropical cyclones?**

| EXAM YEAR | PAPER | SUBJECT |
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| MARKS | WORD LIMIT |
|---|---|
| 10 | ~150 words |

## Answer Hint

**Ocean warming, SST anomaly, evaporation, latent heat, atmospheric moisture, convection, low-pressure system, Coriolis force, cyclone intensification, climate change, ocean heat content**

## Model Answer

### Introduction

Sea Surface Temperature (SST) rise refers to an increase in the temperature of the upper ocean surface relative to the climatic average. Warm tropical oceans provide the primary energy source for tropical cyclones.

### Mechanism

1. **Enhanced evaporation:** Warmer seawater increases evaporation, loading the atmosphere with greater quantities of moisture.
2. **Latent heat release:** Moist air rises and condenses, releasing latent heat that warms the surrounding atmosphere.
3. **Lower atmospheric pressure:** Increased convection and heat release can deepen the low-pressure centre.
4. **Positive feedback:** A stronger cyclone increases evaporation and moisture uptake, potentially further intensifying the system.
5. **Rapid intensification:** When other atmospheric conditions are favourable, unusually warm waters can accelerate cyclone strengthening.

## Important Conditions

SST alone does not create a cyclone. Adequate Coriolis force, atmospheric instability, sufficient moisture and relatively low vertical wind shear are also necessary.

## Conclusion

Rising SST can increase the potential intensity and rapid intensification of tropical cyclones by supplying greater heat and moisture. Thus, ocean warming is an important factor in understanding changing cyclone risks in a warming climate.

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