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## Ultra High-Performance Concrete (UHPC) | Uttar Pradesh | 12 Jul 2024

### Why in News?

According to the sources, The [Uttar Pradesh public works department \(PWD\)](#) will have a tie-up with **IIT-Kanpur** to **develop ultra high-performance concrete (UHPC)** after research and development.

### Key Points

- Currently, **M60 cement grade** is used in most civil works in the state.
- UHPC, which has a **longer shelf life** and can be **4-6 times stronger than M60 grade**, and can significantly **reduce the department's carbon footprint**.
  - This reduction would be achieved by **using thinner sections and lower deck heights** during the construction of bridges, flyovers, elevated roads, railway overbridges, and other concrete-intensive **infrastructure projects**.
  - The product, developed using [nanotechnology](#), is expected to be ready in three years.

### Carbon Footprint

- According to the [World Health Organization \(WHO\)](#), a carbon footprint is a **measure of the impact people's activities** have on the amount of carbon dioxide (CO<sub>2</sub>) produced through the burning of fossil fuels and is **expressed as a weight of CO<sub>2</sub> emissions produced in tonnes**.
- It is **usually measured as tons of CO<sub>2</sub> emitted per year**, a number that can be supplemented by tons of CO<sub>2</sub>-equivalent gases, including [methane](#), [nitrous oxide](#), and other [greenhouse gases](#).
- It can be a broad measure or be applied to the actions of an individual, a family, an event, an organization, or even an entire nation.