New Biodegradable Polymer

Why in News

Recently, scientists have developed a **New biodegradable polymer**, using **Guar Gum, and Chitosan**, which has high potential for packaging material.

Key Points:

- **About:**
  It is a **guar gum-chitosan composite film** which is a **cross-linked polysaccharide** developed with the help of **solution casting method** (a simple technique to make polymer films). It overcomes the challenges of polysaccharides.
    - **Polysaccharides** is one of the **biopolymers with high potential for use in synthesis of packaging material.**
    - However, due to some drawbacks of polysaccharides, such as low mechanical properties, high water-solubility, and low barrier properties, they are not preferred.
    - **Guar Gum,** and **Chitosan** are polysaccharides extracted from guar beans and shells of crab and shrimps.
- **Properties of the Film:**
    - **High water stability, high mechanical strength** as well as **excellent resistance** towards harsh environmental conditions.
      The fabricated cross-linked film is **not easily soluble in water**. As per scientists, it did not dissolve even after 240 hours.
    - It is **highly water repellent or hydrophobic** because of its high contact angle of 92.8º.
    - **Water vapor permeability is low** as compared to the film made only from chitosan.
      Vapour permeability is a material's ability to allow a vapour (such as water vapour or, indeed any gas) to pass through it.

- **Significance:**
    It is likely to **help effectively deal with the menace of piling non-biodegradable packaging materials,** including water and soda bottles.
        Normally, Polymers have a **wide variety of industrial and commercial uses** but it is not biodegradable and hence poses a **major challenge to the environment and earth's ecosystem.**

Source: PIB