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## Renewable Energy & Land Use in India

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### Why in News

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Recently, a report named **Renewable Energy and Land Use in India by Mid-Century** suggested that **careful planning today can maximise the benefits** and minimise the costs of India's history-making **energy transition**.

- It was released by the Institute for **Energy Economics and Financial Analysis (IEEFA)** which examines issues related to energy markets, trends and policies.
- It's mission is **to accelerate the transition to a diverse, sustainable and profitable energy economy**.

### Key Points

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- **Land-Use for Renewables:**
  - India will use **significant stretches of land by 2050** to install renewable energy generation capacities.  
Around **50,000-75,000 square kilometres** of land will be used in 2050 for **solar energy** generation and for an additional **15,000-20,000 sq km for wind energy projects**.
  - In India, **electricity generation has to compete with alternative uses for land** such as agriculture, **urbanisation**, human habitation and nature conservation, unlike Europe or the US.
- **Co-Existence:**

Properly managed **renewable generation can co-exist with other land uses**, and, unlike coal-based power, it does not fundamentally change land during use or following its ultimate decommissioning.
- **Carbon Emission:**
  - The resulting land cover changes, including indirect effects, will likely **cause a net release of carbon up to 50 grams of carbon dioxide per kilowatt-hour (gCO<sub>2</sub> / kwh)**.
  - The amount of carbon release will **depend on the region, scale of expansion, solar technology efficiency and land management practices** at solar parks.

- **Effect on Ecosystems:**

- Land use for renewable energy may **put a pressure on a variety of ecosystems**. Generally the terms **zero impact areas, barren land, unused land** or the official designation of **wasteland** imply that such areas have no value.
  - Open Natural Ecosystems (ONE), classified as wastelands, covered around 10% of India's land surface.
  - The **largest stretches** are found in Rajasthan, Madhya Pradesh, Maharashtra, Andhra Pradesh and Gujarat.
- However some of these have the "**highest densities and diversity of large mammalian fauna**" and also support livelihoods of local populations.

Earlier the **Supreme Court** directed all power lines of solar power units passing through **Great Indian Bustard** habitats in Rajasthan and Gujarat to be laid underground - as the overhead transmission lines could threaten the endangered species.

- **Suggestions:**

- **Reduce Environmental Damage:**

**Optimising the size of land used, its location** and impact on human habitation, agriculture and conservation of natural resources to **reduce environmental damage**.
- **Minimizing Land Use:**

Minimising total land-use requirements for renewable energy by **promoting offshore wind, rooftop solar and solar on water bodies**.
- **Land Assessment:**
  - Identification and assessment of land for renewable generation by **limiting undue regional concentration and developing environmental and social standards** for rating potential sites.
  - Policy makers and planners should **exclude ONE with high density habitats** when considering location of renewable energy projects.
- **Incentivising Agri Voltaics:**

Attention on Indian agri-voltaics sector — securing benefits to farmers and **incentivising agri voltaics** uptake where crops, soils and conditions are suitable and yields can be maintained or improved.

**Agri voltaics** combine the agricultural use of land with the production of electric energy by photovoltaics.

**Source: DTE**