Clean Energy Ambitions

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Clean Energy Ambitions: Ecological Costs Ignored

Context

In early **2025**, India added **3.5 GW** of wind power capacity, marking an impressive **82% year-on-year growth**. While this reflects India's strong push towards renewable energy, it has also triggered ecological concerns. A study by the **Wildlife Institute of India (WII)** highlighted a significant rise in **bird deaths** near wind turbines in **Rajasthan's Thar Desert**, sparking national debate on the unintended environmental costs of clean energy expansion.

Introduction

India's transition to **clean energy** is essential to meet its **climate commitments** and reduce carbon emissions. However, the expansion of wind power infrastructure, especially in **ecologically sensitive regions**, must be balanced with the need to **conserve biodiversity**. Recent findings from the Thar Desert reveal a disturbing trend of increasing **avian mortality** linked to wind turbines, urging the need for a more integrated and responsible renewable energy policy.

Key Findings from the WII Study (Thar Desert)

- The study was conducted across a **3,000 sq. km area** in **Jaisalmer, Rajasthan**.
- It covered **90 wind turbines**, where **124 bird carcasses** were found.
- An estimated **4,464 bird deaths per 1,000 sq. km per year** were recorded.
- **Control sites** with no turbines showed **zero bird deaths**.
- Critically endangered species such as the **Great Indian Bustard** were found to be at risk.

- **Raptors** were the most affected group due to their flight patterns and biological vulnerability.
- Bird deaths were caused by **collisions with turbine blades** and **associated power lines**.

Why Bird Mortality is a Serious Concern

- The **Thar Desert** lies on a major **migratory flyway**, and wind turbines disrupt these routes.
- **Raptors**, with slow reproductive cycles, are especially vulnerable to population decline due to increased mortality.
- Regions like **Jaisalmer** are rich in **bird biodiversity**, including **endangered species**.
- Earlier studies underestimated the risk due to **limited turbine coverage** and **lower bird density**.
- Loss of birds disrupts **ecological balance**, leading to **pest outbreaks** and harming **agricultural productivity**.

Policy Gaps and Ecological Oversight Issues

- **Onshore wind farms** are currently **exempt from mandatory Environmental Impact Assessments (EIAs)**.
- Wildlife clearance processes often **overlook biodiversity impacts**, especially in ecologically rich zones.
- **Offshore wind projects** are based on **rapid and shallow EIAs**, lacking depth and long-term vision.
- Present assessments do not account for **cumulative regional and ecological impacts**.
- There is a lack of **coordination between MNRE and MoEFCC**, delaying ecological safeguards and action.

Proposed Mitigation Measures and Tools

- **Painting one turbine blade black** has been found to reduce bird collisions by enhancing blade visibility.
- **Timed shutdowns** of turbines during **peak bird migration** can significantly reduce mortality.
- **Reorienting turbine layouts** to avoid bird flyways can minimize ecological disruption.
- Use of tools like **AVISTEP** can help in **mapping bird-sensitive zones** for responsible site planning.
- **Ground-level field surveys** are essential to support and validate data obtained through remote sensing.

Way Forward

- Mandate **comprehensive EIAs** for both **onshore and offshore wind energy projects**.
- Promote **ecology-based zoning**, with wind sites allocated based on **avian migration routes** and **biodiversity data**.
- Deploy **radar systems and AI tools** to monitor bird movement and enable **automated turbine shutdowns** when necessary.
- Involve **ecologists and local communities** in planning, siting, and clearance processes.
- Support **long-term, multi-seasonal research** to assess and mitigate biodiversity risks associated with wind energy.

Conclusion

While India's shift to **renewable energy** is critical for achieving **sustainable development goals**, it should not come at the expense of **biodiversity**. The rising bird mortality in the **Thar Desert** underscores the need for **ecological planning**, **scientific site selection**, and **stringent impact**

assessments. A truly green transition requires a balance between **clean energy development** and **environmental conservation**, ensuring that progress does not compromise the planet's ecological health.