Mains Practice Question

Q. With the growing demand for energy and given the state of India's renewable energy sector, can bio-energy replace non-renewable source of energy and fulfill India's energy needs? Discuss (250 words)

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Approach

- Start your answer by briefly describing the status of renewable energy in India.
- Discuss the significance bio-energy in replacing non-renewable source of energy in India.
- Conclude accordingly.

Introduction

- Bioenergy is one of many diverse resources available to help meet our demand for energy. It is a form of renewable energy that is **derived from recently living organic materials known as biomass,** which can be used to produce transportation fuels, heat, electricity, and products.

Body

- **Potential:**
  - As per a recent study sponsored by Ministry of New and Renewable Energy (MNRE), the **current availability of biomass in India is estimated at about 750 million metric tonnes per year.** The Study indicated estimated surplus biomass availability at about 230 million metric tonnes per annum covering agricultural residues corresponding to a potential of about **28 GW.**
  - This apart, about 14 GW additional power could be generated through bagasse-based cogeneration in the country's 550 Sugar mills, if these sugar mills were to adopt technically and economically optimal levels of cogeneration for extracting power from the bagasse produced by them.
- **Benefits Bio-Energy:**
  - Abundant and renewable bioenergy can contribute to a more secure, sustainable, and economically sound future by:
    - Supplying domestic clean energy sources
    - Reducing India's dependence on foreign oil
    - Generating jobs
    - Revitalizing rural economies
- **Significance Bio-Energy:**
  - **Pollution Free Cities:**
    - The biogas solution can help make our **cities clean and pollution-free.**
    - Leaching of toxic substances from landfills contaminates the groundwater.
    - Decomposing organic matter releases huge amounts of methane into the environment, causing **air pollution** and **global warming** as methane is a very potent GHG.
  - **Handling Organic Waste:**
    - Installing large-scale municipal biogas systems can help cities **handle organic waste efficiently** to overcome the environmental and socio-economic challenges

posed by overburdened landfills.
        - Municipal waste can be **fed into these plants to create clean and green fuel,** along with **biofertilizers,** while keeping the cities clean and hygienic.
    - **Helpful for Women:**
        - Switching to biogas could be good for women because **they won't be exposed to harmful smoke and pollution.**
        - The female members of a household are affected by indoor pollution as they spend more time inside the house.
    - **Will Transform Energy Dependence:**
        - Biogas can play a critical role in **transforming the energy dependence of rural and agricultural communities,** which majorly depends on burning wood, dung, charcoal, coal and other fossil fuels for their energy needs.
        - The high dependence on non-renewable sources is the leading cause of the long-standing energy problems in the country.
- **Challenges:**
    - **Transmission Loss:** The capacity of the plants may not always translate into actual power generation for the grid due to loss from outside sources like heat & transmission losses.
    - **Seasonal Variation:** Wind and solar energy are erratic resources; for instance, home power use rises in the nights despite the fact that solar energy is abundant during the day. There are seasonal differences as well. Wind energy is abundant during the monsoons whereas solar energy is scarce.
    - **Location Based Issue:** Because coastal areas experience more wind, they are better able to harness that wind energy.
- **Government Initiatives to Promote Bio-Energy:**
    - **SATAT Scheme:** The Indian government and Niti Aayog have outlined roadmaps to hasten our transition towards green fuels and promote LNG, hydrogen and methanol.
    - **Pradhan Mantri- Kisan Urja Suraksha evam Utthaan Mahabhiyan: PM- KUSUM** aims to provide financial and water security to farmers through harnessing solar energy capacities of 25,750 MW by 2022.
        - Solarisation of water pumps is a step in distributed power providing at the doorstep of the consumer.
    - The Ministry of New and Renewable Energy on its website also hosts **Akshay Urja Portal and India Renewable Idea Exchange (IRIX) Portal.**
        - IRIX is a platform that promotes the exchange of ideas among energy conscious Indians and the Global community.

Conclusion

In the near future, non-renewable source of energy cannot be immediately substituted, but in longer run with help of various government initiatives India could potentially replace non-renewable energy with renewable energy.

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