OSP-34

Sustainable Energy Generation through *Prosopis Juliflora* Biomass- Based Briquettes

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Fossil fuels account for over 80% of global energy consumption and are projected to face critical depletion within the next 50 years if current usage trends persist. On the other hand, due to overpopulation, global energy demand is expected to increase by approximately 50% over the next 20 years, reaching around 778 EJ by 2035. With diminishing fossil fuel reserves and growing energy demand, the shift toward renewable energy sources has become essential. Among the plant biomass resources in India, *Prosopis juliflora* is one of the most widely adapted species. It has been listed among the world's 100 most dominant invasive species. Currently, *P. juliflora* is estimated to occupy more than 500,000 ha, although its density varies across different regions and habitats. *Prosopis juliflora* demonstrates allelopathic effects by releasing chemical compounds that inhibit the germination and growth of neighbouring plant, which allows it to monopolize space and resources in the ecosystem. The efforts taken to control or eradicate *Prosopis juliflora* around the world have been found expensive and ineffective. Thus, strategically exploiting *Prosopis juliflora* by transforming its biomass into briquettes can mitigate its invasiveness and contribute to renewable energy production, offering a super sustainable solution to both ecological and energy issues. The present work aims to investigate the potential of *Prosopis juliflora* biomass as a feedstock for sustainable briquette production.

Keywords: Briquette, Prosopis juliflora, Renewable energy, Sustainable development

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