

## BIOTECHNOLOGY AS A CATALYST FOR SUSTAINABLE AND INCLUSIVE RURAL DEVELOPMENT

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*This study examines how conventional and modern biotechnologies contribute to sustainable rural development by improving agriculture, healthcare, livelihoods, and environmental resilience. It evaluates the performance and scalability of bio fertilizers, biopesticides, tissue culture, molecular breeding, and bioenergy systems across diverse rural contexts. The analysis identifies major adoption barriers-including regulatory gaps, quality-control issues, and limited awareness-and proposes an inclusive framework integrating policy support, community participation, and capacity building to promote climate-resilient and equitable biotechnology-driven rural development.*

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