

Quantifying the Impact of Climate Change on Agritourism: The Transformative Role of Solar Energy in Enhancing Growth and Resilience in Eritrea

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Abstract : Agritourism in Eritrea is increasingly threatened by climate change, manifesting through rising temperatures, shifting rainfall patterns, and resource scarcity. This study employs quantitative methods to assess the economic and environmental impacts of climate change on agritourism, utilizing metrics such as annual income fluctuations, changes in visitor numbers, and energy consumption patterns. The methodology relies on secondary data sourced from the World Bank, government reports, and academic publications to analyze the economic viability of integrating solar energy into agritourism operations. Key variables include the Benefits from Renewable Energy (BRE), encompassing cost savings from reduced energy expenses and the monetized value of avoided greenhouse gas emissions. Using a net present value (NPV) framework, the research compares the impact of solar energy against traditional fossil fuel sources by evaluating the Value of Reduced Greenhouse Gas Emissions (CO₂) and the Value of Health-Related Costs (VHRC) due to air pollution. The preliminary findings of this research are of utmost importance. They indicate that the adoption of solar energy can enhance energy independence by up to 40%, reduce operational costs by 25%, and stabilize agritourism activities in climate-sensitive regions. This research aims to provide actionable insights for policymakers and stakeholders, supporting the sustainable development of agritourism in Eritrea and contributing to broader climate adaptation strategies. By employing a comprehensive cost-benefit analysis, the study highlights the economic advantages and environmental benefits of transitioning to renewable energy in the face of climate change.

Keywords : agritourism, climate change, renewable energy, cost benefit analysis, resilience, cost-benefit analysis

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