

Harvesting Alternative Energy: Exploring Exergy, Human Power, Animal Body Heat, and Noise as Sustainable Sources

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Abstract : The excessive use of non-renewable fossil fuels has led to a pressing energy crisis that demands urgent attention. While renewable sources like solar, wind, and water have gained significant attention as alternatives, we must explore additional avenues. This study takes an interdisciplinary approach, investigating the potential of waste streams from energy production and other untapped natural sources as sustainable energy solutions. Through a review of case studies, this study demonstrates how these alternative sources, including human power, animal body heat, and noise, can seamlessly integrate into architecture and urban planning. This article first discusses passive design strategies integrating alternative energy sources into vernacular architecture. Then, it reviews the waste stream (exergy) and potential energy sources, such as human power, animal body heat, and noise, in contemporary proposals and case studies. It demonstrates how an alternative energy design strategy may easily incorporate these many sources into our architecture and urban planning through passive and active design strategies to increase the energy efficiency of our built environment.

Keywords : alternative energy sources, energy exchange, human and animal power, potential energy sources, waste stream

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