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A review of Sustainable Construction Practices enabled by Internet of Things (IoT): Case Studies and Innovations

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This review explored the integration of sustainable construction practices with IoT technologies, emphasizing their combined potential to minimize environmental impact and enhance efficiency throughout the construction lifecycle. Sustainable construction focuses on resource efficiency, energy conservation, and the use of renewable materials to mitigate climate change, preserve natural resources, and improve environmental quality. IoT technologies facilitate precise monitoring and management of energy, water, and materials through embedded sensors, enabling adjustments based on occupancy and environmental conditions. Key IoT applications include real-time data monitoring in smart buildings, waste management optimization, and enhanced concrete curing processes. These innovations contribute to reducing carbon footprints, conserving resources, and improving building performance and occupant well-being. Challenges in IoT implementation include technical interoperability, cybersecurity risks, upfront costs, and regulatory complexities, which vary across regions. Developing countries like Sri Lanka face additional hurdles due to limited access to comprehensive digital databases necessary for AI-driven insights and efficient construction management. Addressing these challenges requires digitizing project records, fostering data collaboration, and investing in digital infrastructure and skill development. Overcoming these barriers could position Sri Lanka at the forefront of digital innovation in construction, driving economic growth and enhancing infrastructure resilience. Overall, IoT integration in sustainable construction holds promise for advancing global sustainability goals through enhanced efficiency, reduced environmental impact, and improved project outcomes.

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