|  |  |  |  |
| --- | --- | --- | --- |
| **Title:** | Harvesting Solar Power for IoT-Driven Water Purification and Monitoring Systems | | |
| **Author(s) Name:** | Redowan Ahmed; Tarifuzzaman Riyad; Ahsanul Haque; Muhibul Haque Bhuyan | | |
| **Contact Email(s):** | muhibulhb@aiub.edu | | |
| **Published Journal Name:** | Proceedings of the 2025 4th International Conference on Innovations in Science, Engineering and Technology (ICISET) | | |
| **Type of Publication:** | Conference Proceedings | | |
| **Volume:** | 27 | Issue | - |
| **Publisher:** | IEEE | | |
| **Publication Date:** | 10 June 2025 | | |
| **ISSN:** | - | | |
| **DOI:** | https://doi.org/10.1109/ICCIT64611.2024.11021914 | | |
| **URL:** | https://ieeexplore.ieee.org/document/11021914 | | |
| **Other Related Info.:** | Place: Long Beach Hotel, Cox’s Bazar, Bangladesh, pp. 2588-2593., Conference Date: 20-22 December 2024. Conference Link: https://iccit.org.bd/2024/home/ | | |
|  | | | |

|  |  |
| --- | --- |
| **Abstract:** |  |
| Abstract— An integrated, autonomous, and efficient water purification and monitoring system is presented, leveraging the Internet of Things (IoT) technology and solar energy for sustainability. The system features a solar-powered water decontamination scheme with filtration and sterilization methods, ensuring a clean water supply. Real-time monitoring and control are enabled through an IoT framework, optimizing system operation and operator intervention. The solar power supply unit utilizes a few photovoltaic (PV) boards to harness sunlight during sunny days and then store surplus electrical energy for persistent management of the whole purification and monitoring system. A microcontroller is the central hub, communicating with sensors to measure water quality parameters and oversee energy balance. Sensor data is transmitted to a Google Sheet for online storing and probing. A user-friendly interface that can be accessed via a mobile App or web dashboard, facilitates monitoring of water quality through different parameter values, system status, and energy levels. Alerts are generated for timely maintenance or adjustments, enhancing system reliability. | |