

Development and Investigation of Sustainable Wireless Sensor Networks for forest Ecosystems

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Abstract : Solar-powered wireless sensor nodes work best when they operate continuously with minimal energy consumption. Wireless Sensor Networks (WSNs) are a new technology opens up wide studies, and advancements are expanding the prevalence of numerous monitoring applications and real-time aid for environments. The Selective Surface Activation Induced by Laser (SSAIL) technology is an exciting development that gives the design of WSNs more flexibility in terms of their shape, dimensions, and materials. This research work proposes a methodology for using SSAIL technology for forest ecosystem monitoring by wireless sensor networks. WSN monitoring the temperature and humidity were deployed, and their architectures are discussed. The paper presents the experimental outcomes of deploying newly built sensor nodes in forested areas. Finally, a practical method is offered to extend the WSN's lifespan and ensure its continued operation. When operational, the node is independent of the base station's power supply and uses only as much energy as necessary to sense and transmit data.

Keywords : internet of things (IoT), wireless sensor network, sensor nodes, SSAIL technology, forest ecosystem

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