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Green Smart Environments Using a Comprehensive Cloud Management and Wireless Detecting Network

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Introduction

Human development has a negative impact on the global environment. With population growth, pollution, and climate change, many industries have begun to improve their living conditions in order to achieve the goal of sustainable development. Currently, environmental engineering primarily employs long-term monitoring of environmental pollution and greening techniques; however, the "benefits of greening engineering" are rarely included among the items it inspects. The global population increased rapidly in the early nineteenth century, and the Industrial Revolution thrived when social and scientific conditions were met. Because of large-scale human activity and development, as well as excessive greenhouse gas emissions, massive changes in the environment have occurred, resulting in global warming, climate change, and changes in other environmental factors [1-3].

Because of the major issue mentioned previously, a method to protect the environment was recently proposed. The Vertical Greening Modular System (VGMS) is a growingly popular building envelope solution that aims to improve the aesthetic quality of new and existing façades while also achieving energy efficiency. The VGMS was developed and tested as part of a research project in Turin (northern Italy). The VGMS achieves a 40% reduction in equivalent thermal transmittance measurement, affecting the amount of energy passing through the exterior wall during warm seasons significantly. In summer, the outdoor surface temperature of the wall was reduced by 23°C, which improved outdoor comfort and reduced urban heat island . Another research focus was on pavement watering.

A study on a new PV panel thermal model conducted at the Czech University of Life Sciences' roof laboratory examined the differences between freestanding and roof-integrated configurations in various locations (cold, medium, warm, hot). The panel can reduce annual power generation by 3-4% in cold, mild, and warm climates, and by more than 5% in hot climates. This study developed urban construction using relevant technology to assist with urban governance, green engineering techniques, and renewable energy. In addition, Internet of Things (IoT) technology was incorporated to improve urban environments and energy-saving problems for cities, where clean energy and environmentally friendly approaches were used to facilitate clean urban environments and sustainable development. An examination of energy saving and the greening benefits of green construction in civil engineering was implemented based on two elements, environmental engineering and architecture energy saving. The advantages of photovoltaic reusable energy in electrical engineering for building cooling and power savings were also investigated.

Based on the concept of smart cities and the use of Internet of things technology, this paper established a wireless environmental monitoring and management system in urbanised city campus environments to monitor and quantify the benefits of greening projects to the campus environment over time. This study looked at three different cases. A green roof, a pervious road, and a photovoltaic roof were the subjects [4,5]. The quantitative findings can be used to estimate and calculate energy savings/consumption or carbon emissions, and they can also be used as a reference for urban governance. Smart environments include measures to improve environmental monitoring. A smart city subdevelopment project gathers environmental information using ICT, inspects the environment using data analysis methods, and develops environmental management improvement plans to address environmental problems and improve urban residential environment safety and quality. Rapid, massive industrialization and urbanisation have imposed significant environmental burdens on Taiwan; thus, environmental management strategies should be comprehensive, with enhanced environmental conservation concepts.

Conclusion

In addition to these concerns, there are issues with environmental monitoring, such as sensor expiration, the harshness of the monitored environment, and transmission and electricity problems due to remoteness. As a result, establishing environmental monitoring is extremely difficult. Effective applications of environmental monitoring data, on the other hand, are expected to reduce ecological and environmental damage, aid in the development of effective management strategies, and prevent artificial damage and natural disasters.

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