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Solar-Powered Smart Irrigation System as an Adaptation Strategy under Climate Change: A Case Study to Develop Medicinal Security Based on Ancestral Knowledge

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Abstract : According to the 2030 Agenda for Sustainable Development Goals (SDG) in which equal importance is given to economic, social, and environmental dimensions where the equality and dignity of each human person is placed at the center of discussion, changing the development concept for one with more responsibility with the environment. It can be found that the energy and food systems are deeply entangled, and they are transversal to the 17 proposed SDG. In this order of ideas, a research project is carried out at Unidad Central del Valle del Cauca (UCEVA) with these two systems in mind, on one hand the energy transition and, on the other hand the transformation of agri-food systems. This project it could be achieved by automation and control irrigation system of medicinal, aromatic, and condimentary plants (MACP) area within the UCEVA Agroecological Farm and located in rural area of Tulua municipality (Valle del Cauca Department, Colombia). This system have allowed to stablish a remote monitoring of MACP area, including MACP moisture measurement, and execute the required system actions. In addition, the electrical system of irrigation control system is powered by a scalable photovoltaic solar energy system based on its specifications. Thus, the developed system automates and control de irrigation system, which is energetically self-sustainable and allows to satisfy the MACP area requirements. Is important to highlight that at MACP area, several medicinal, aromatic, and condimentary plants species are preserved to become primary sources for the pharmaceutical industry and, in many occasions, the only medicines for many communities. Therefore, preserve medicinal plants area would generates medicinal security and preserve cultural heritage as these plants are part of ancestral knowledge that penetrate academic and research communities at UCEVA campus to other society sectors.

Keywords : ancestral knowledge, climate change, medicinal plants, solar energy
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